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JOURNAL OF THE PROCEEDINGS

OF THE

LINNEAN SOCIETY.

Vol. VI. No. 21.

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1861.

PROCEEDINGS

OF THE

LINNEAN SOCIETY OF LONDON.

November 1st, 1860.

Thomas Bell, Esq., President, in the Chair.

Mr. Joshua Clarke, F.L.S., exhibited specimens of a new British plant (*Lathyrus tuberosus*) found last autumn at Fyfield, near Ongar, Essex; and read a short notice of it. (See "Botanical Proceedings," vol. v.)

Read, "Introduction to the Florula of Aden;" by Thomas Anderson, Esq., F.L.S. (See "Botanical Proceedings," Supplement to vol. v.)

November 15th, 1860.

Thomas Bell, Esq., President, in the Chair.

Read, first, "Catalogue of Dipterous Insects collected by A. R. Wallace, Esq., in Batchian, Kaisaa, and Makian, and at Tidon in Celebes; with descriptions of new Species," by Francis Walker, Esq., F.L.S. (See "Zoological Proceedings," vol. v.)

Read, secondly, "Catalogue of the Dipterous Insects collected by Mr. Wallace at Manado in Celebes, and in Tond, with descrip-

tions of new Species"; by the same. (See "Zoological Proceedings," vol. v.)

Read, thirdly, "Note on the Fructification and Affinities of *Hydnum gelatinosum*, Fr.," by Frederick Currey, Esq., M.A., F.R.S. & L.S. (See "Botanical Proceedings," vol. v.)

Read, fourthly, "Extracts of a Letter from Miss Drew to Mr. Robert Paterson, of Belfast, On the Habits of Singing Mice." Communicated by the President.

December 6th, 1860.

Thomas Bell, Esq., President, in the Chair.

William S. Atkinson, Esq.; Frederic John Farre, Esq., M.D.; Maxwell T. Masters, Esq.; and Walter Moxon, Esq., M.B., were elected Fellows.

Sir Charles Bunbury, Bart., F.L.S., exhibited a specimen of *Cinclidium stygium*, a rare moss, new to the county of Suffolk. In a note, dated Nov. 19th, 1860, which accompanied the specimen, Sir Charles states that it was discovered, at the beginning of the month by Mr. Edmund Skeppar, of Bury St. Edmunds, on Tuddenham Heath, near Mildenhall, long since noted as the locality of several rare plants, and especially of *Liparis Læselii*.

Read, first, "Notes on *Sphærularia Bombi*;" by John Lubbock, Esq., F.R.S., F.L.S.

Read, secondly, "The Natural Order *Aurantiaceæ*, with a Synopsis of the Indian Species;" by Daniel Oliver, Esq., F.L.S., Prof. Bot. Univ. Coll., Lond. (See "Botanical Proceedings," 2nd Supplement to vol. v.)

December 20th, 1860.

George Bentham, Esq., V.P., in the Chair.

Thomas Walker, Esq., B.A., was elected a Fellow.

Mr. Bentham, V.P.L.S., exhibited specimens of a species of *Cavanillesia*, probably *C. platanifolia*, Humb. and Bonpl., brought from the neighbourhood of New Carthagena by M. Anthoine, and stated by him to have been obtained from a young tree felled by him, which measured 140 feet in height, without branches, except the parasol-like crown. The specimens consisted of flowers, fruit, a piece of the soft, pith-like wood, and of the liber, which closely resembles the Cuba Bass, but is of a somewhat coarser fibre.

Read, first, a Letter from C. C. Babington, Esq., F.R.S., F.L.S., announcing the discovery by Mr. G. Wolsey of *Isoëtes Hystrix*, Durieu, on L'Ancresse Common, in the Island of Guernsey. (See "Botanical Proceedings," vol. v.)

Read, secondly, an Extract of a Letter from Mr. Henry Mouhot to S. Stevens, Esq., F.L.S., dated Bankok, Siam, 7th April, 1860, and giving a description of the "Cambodian Mode of Engrafting."

Read, thirdly, Extract of a Letter from Dr. W. F. Daniell, F.L.S., to Mr. Kippist, dated Tien Tsin, Oct. 10th, 1860, and giving some account of the cultivated fruits and *Cerealia* of Northern China.

Read, fourthly, "Further Observations on *Entozoa*, with Experiments," by T. S. Cobbold, Esq., M.D., F.L.S. (See "Transactions," vol. xxiii. part 2.)

Read, fifthly, "On *Sclerostoma Syngamus*, and the Disease which it occasions in Birds;" by the same. (See "Zoological Proceedings," vol. v.)

Read, sixthly, "Notice of the Discovery of a Second Species of *Gyrodactylus* (*G. anchoratus*, Nordm.), parasitical upon certain Fish;" by C. L. Bradley, Esq., F.L.S. (See "Zoological Proceedings," vol. v.)

January 17th, 1861.

Thomas Bell, Esq., President, in the Chair.

Christopher Dresser, Esq., Ph. D.; Robert Charles Hurst, Esq.; and John Millar, Esq., were elected Fellows.

Read, first, "On Prolification in Flowers, and especially on that form termed Median Prolification;" by Maxwell T. Masters, Esq., F.L.S. (See "Transactions," vol. xxiii. part 2.)

Read, secondly, Extract from a Letter, addressed to Sir W. J. Hooker, by Dr. Frederick Welwitsch, dated S. Paul de Loanda, Aug. 16th, 1860; and giving some account of the Botany of Benguela, Mossamedes, &c., in Western Africa. (See "Botanical Proceedings," vol. v.)

Certain alterations in the Bye-laws, agreed to by the Council, were read by the President, and ordered to be hung up in the Meeting-room.

February 7th, 1861.

Thomas Bell, Esq., President, in the Chair.

William Carruthers, Esq., was elected a Fellow.

Dr. J. D. Hooker, F.R.S., F.L.S., exhibited a specimen of a new species of *Araucaria* (*A. Rulei*, Ferd. Müll.) from a volcanic islet off New Caledonia.

Read, a paper "On the Occurrence of *Festuca ambigua*, Le Gall, in the Isle of Wight;" by Alexander G. More, Esq., F.L.S. (See "Botanical Proceedings," vol. v.)

February 21st, 1861.

Thomas Bell, Esq., President, in the Chair.

Arthur William Crichton, Esq.; Henry Tattershall Knowles Kempton, Esq.; Capt. Augustus Frederick Lendy; David Moore, Esq.; and Christopher Knox Ord, Esq., M.D., were elected Fellows; and Mr. William Laughrin was elected an Associate.

Read, first, Extracts from Letters addressed to Sir William and Dr. Hooker by Mr. Gustav Mann, giving an account of his second Ascent of Clarence Peak, Fernando Po. (See "Botanical Proceedings," vol vi.)

Read, secondly, "A Glance at the Botany of the North Shore, Sydney;" by William Woolls, Esq. Communicated by the Librarian.

Read, thirdly, "Catalogue of the Dipterous Insects collected by Mr. A. R. Wallace at Gilolo, Ternate, and Ceram;" by Francis Walker, Esq., F.L.S. (See "Zoological Proceedings," vol. vi.)

Read, fourthly, "Description of a (supposed) new Annelid;" by E. Hart Vinen, Esq., M.D., F.L.S. (See "Zoological Proceedings," vol. vi.)

The alterations in the Bye-laws, proposed by the Council on the 17th of January, having been hung up in the Common Meeting-room of the Society, and read by the President at the two last successive General Meetings of the Society, were put to the Ballot, and confirmed by the Fellows at large in the terms of the Charter. (Copies of the modified Bye-laws, embodying these alterations, have been forwarded, by post, to the Fellows residing within the United Kingdom.)

March 7th, 1861.

Thomas Bell, Esq., President, in the Chair.

Benjamin Carrington, Esq., M.D., was elected a Fellow.

Mr. Busk, F.R.S., Sec. L.S., exhibited the skull of a child between four and five years of age, procured by Mr. Mann in the mountainous region of Fernando Po, and said to belong to a peculiar race of Negroes, inhabiting the higher parts of the island. The skull offered some peculiarities of conformation, which rendered it of considerable interest.

Read, first, "Notes on *Menispermaceæ*, *Tiliaceæ*, *Bixaceæ*, and *Samydaceæ*;" by George Bentham, Esq., V.P.L.S. (See "Botanical Proceedings," 2nd Suppl. to vol. v.)

Read, secondly, "On the Vegetation of Clarence Peak, Fernando Po; with Descriptions of Mr. G. Mann's Plants from the higher parts of that Mountain;" by J. D. Hooker, Esq., M.D., F.R.S., F.L.S. (See "Botanical Proceedings," vol. vi.)

Read, secondly, a Letter from Dr. Thomson to Dr. Hooker, on some plants collected at Aden.

Read, thirdly, the following "Note on *Omphalocarpon procerum*, Pal. Beauv.;" by George Bentham Esq., V.P.L.S. (accompanied by specimens).

The specimens now exhibited were gathered by Mr. Mann on the Cameroon River, in West Tropical Africa, and from the similarity of the general aspect of the tree, its foliage, and the remarkable fruits growing sessile on the main trunk, I have no hesitation in referring them to the *Omphalocarpon procerum* of Pal. de Beauvois, who found the tree in nearly the same district of West Tropical Africa, and figured it in his "Flore d'Oware et de Benin," vol. i. p. 7, pl. 5 & 6. Our flowers are indeed very different in the details of their structure from those described by De Beauvois; but any one who has much studied the above-quoted work, will have detected many instances where the detailed analyses of the flowers are very incorrect, owing sometimes to the fragmentary state of the specimens, at others to their having been mismatched, or the parts totally wanting supplied from recollection, or even from the imagination of the artist. Our flowers, like his, are females only; but instead of being distinctly gamopetalous, an inch long, with numerous imbricate sepals, I find 5 orbicular, concave sepals, about 3 lines diameter, the 2 outer ones very thick; 5 petals not larger than the sepals, similar in shape, but thinner and slightly connate at the base, where they are also united with the base of the barren filaments; these are numerous and short, the inner ones united in 5 laciniate scales. The ovary is conical with a thin sessile disk-like terminal stigma very minutely toothed; the cells are numerous, annular, with a single laterally attached ovule in each. The fruits, although far from having attained their full size, are as figured by De Beauvois, except that they present in their centre a curious spherical cavity from which the cells radiate. Our seeds are too young to show their internal structure, and still flat; but they have the remarkable long hilum figured.

From these particulars it appears evident that the tree belongs to *Ternstrœmiaceæ*, and not to *Sapotaceæ*. In the absence of the male flower, its precise position in the order cannot be fixed. The flowers are those of *Ternstrœmiaceæ* proper; the fruit comes perhaps nearest to that of *Pyrenoria*; and the seed, if correctly

described, to those of *Schima* and some *Gordonias*. The uniovulate cells of the ovary are peculiar in the order, as also the very remarkable structure of the pericarp, consisting of a number of woody nutlike particles closely fitting into each other, but easily separable.

Read, fourthly, the following "Note on Rope made of Tree-mallow Fibre;" by John Hogg, Esq., M.A., F.R.S., F.L.S.

"About a year ago I read a short paper on the Tree-Mallow (*Lavatera arborea*, Linn.) to the Society (see 'Proceedings,' vol. v. p. 51), in which I made some remarks on this noble British plant; and I also showed some of the woody stem and bark of a specimen of two years' growth. I mentioned at the same time that its *inner bark* was extremely *fibrous*, though coarse, and that it was evidently well-adapted for being formed into strong *ropes*, matting, and the like purposes.

"I have now the pleasure to exhibit a piece of *rope*, which is made of the fibre from the bark of this plant. It is strong, but coarse in texture, and is well-suited to many ordinary uses.

"The rope-maker who prepared it, said he did not think that it was capable of forming the finer cordage, or of receiving a bright polish, like hemp-fibre; but he considered that, as it seemed to become *stronger* and tougher by immersion in *water*, it would very probably be of much use for water or ship purposes.

"I am, however, inclined to think that, since this specimen of rope was manufactured from the fibres of a plant only *one* year old, the fibrous bark might be finer and of a better quality if taken from a two-years' old, or more mature plant.

"The rope-maker further told me that, as the bark gave out a great deal of mucilage, he was of opinion that it might prove serviceable in the fabric of common paper."

Read, fifthly, "Note on an Egg within an Egg;" by the same.

Mr. Hogg exhibited an egg containing within it a second egg, and stated that "whilst eating a common hen's egg in January 1858, he found *within it* what seemed to be a *second*, perfectly formed, but much smaller egg; the external covering being white and, of course, soft. Its length or longer diameter was about $\frac{9}{16}$ of an inch, and its breadth or shorter diameter about $\frac{7}{16}$. It appeared to have within it a *vitellus* or globular yelk."

Referring to other recorded instances of a similar kind, Mr. Hogg mentioned the following account of a communication made to the Academy of Sciences in Paris, January 7th, 1856, by M. Valenciennes. "Note sur les œufs à plusieurs jaunes contenus dans le même coque." "Les œufs renfermant deux jaunes sont très rares, et ceux à trois jaunes le sont encore plus. M. Valenciennes s'en est procuré un, et il le fait passer sous les yeux de l'Académie. Après quelques considérations sur les œufs de poules à deux ou trois jaunes, l'auteur dit qu'il a observé cette duplicité de jaunes dans les œufs de divers autres oiseaux et de plusieurs mollusques." (Rev. Zool., 2 sér. tom. viii. p. 32.), and concluded by observing that the instance noticed by himself and presented to the Society differed from all others he had found recorded, in the circumstance that the egg in his case contained not merely a *double yelk*, but apparently a second *perfect small egg*.

Read, sixthly, "On the Floral Structure of *Osyris peltata*;" by E. de Crespigny, Esq. Communicated by Daniel Hanbury, Esq., F.L.S.

Mr. Howard, F.L.S., exhibited Specimens of *Cinchona Pahudiana* from Java, and made some remarks upon them.

Mr. Howard also read a Letter, addressed to himself by C. R. Markham, Esq., on the Cultivation of the various species of *Cinchona* in Southern India.

May 24th, 1861.

Anniversary Meeting.

Thomas Bell, Esq., President, in the Chair.

This day, the Anniversary of the birth of Linnæus, and the day appointed by the Charter for the election of Council and Officers, the President opened the business of the Meeting with the following Address:—

GENTLEMEN,

THE circumstances under which I meet you to-day cannot fail to excite in me feelings so different from those which have ever

before presented themselves in my long intercourse with the Society, that I have the greatest difficulty in bringing myself to the expression of any of those ordinary topics which have, on previous occasions, formed the subjects of my annual address.

When on this day 46 years—then a very young man—I was admitted into the Society by its estimable founder, how little could I anticipate that I should have to look back upon so long a period of intimate and happy intercourse with many of the most eminent and distinguished naturalists and other scientific men who have, during that time, adorned this country; that I should have formed so many close and pleasant friendships which have constituted one principal charm and solace of the intervening portion of my life; and, above all, that, after an eight years' tenure, I should now be resigning a Chair which had been previously occupied by men whom it is indeed an honour to have succeeded, and my own occupation of which has been rendered so uniformly happy by the kindness and consideration and forbearance of those who placed me there!

It is, indeed, with no ordinary emotion of gratitude that I look back upon this latter and most important period of my fellowship with the Linnean Society. Called, most unexpectedly to myself, to succeed my late revered friend on his retirement, I might well have shrunk from the responsibility of the office, the arduous nature of its duties, and especially from the disadvantageous comparison between my illustrious predecessor and myself. But having once felt assured that my deficiencies (and no one could, I assure you, be more painfully aware of them than myself) might be, in some measure, obviated by an earnest endeavour to master the difficulties of the position, and an assurance, derived from past experience, that I should receive the warm support of the officers and Council, and that every allowance would be made by the Fellows at large for my inevitable shortcomings, I would not allow my misgivings to prevail against the expressed desire of so many of the Fellows. If, as I am assured, I have fulfilled those duties in any degree to their satisfaction, I most thankfully attribute it to the wise counsels, the cordial co-operation and support, and the lenient judgment with which I have at all times been favoured. Still the retrospect of the last eight years cannot but leave a mixed impression on my mind. The recollection of many mistakes (I fear but imperfectly rectified), of opportunities of usefulness neglected and of duties only partially fulfilled, must and ought to cause some regret, especially when it is considered that

the time for improvement is passed, and that in my case is falsified the adage, "Never too late to mend."

The period during which I have been in office has been an eventful one; perhaps I do not exaggerate when, in this respect, I compare it advantageously with any other similar period in the history of the Society; and it will not, I think, be uninteresting or useless if, in my brief valedictory address, I recur to some of the more remarkable events which have distinguished it, with the view of examining how far we have progressed in the fulfilment of our mission, and what has been the result of our work, either within our own immediate circle, or in the more extended sphere of our influence, or of our external relations.

One of the earliest changes which occurred in our arrangements was the establishment of the Journal of Proceedings. Many of you will recollect that before this plan was adopted, papers were occasionally read at our meetings which, however valuable they may have been in themselves, neither required the quarto form for their illustration, nor appeared, in other respects, to be adapted for that mode of publication. In addition to this, the accumulation of important matter which called for more speedy publication than could be effected by the annual issue of the Transactions, demanded, so to speak, a supplementary channel for its appearance. It was proposed that these requirements should be fulfilled by the octavo form of publication to which I am alluding. The innovation was so considerable, and that too in a body so eminently conservative as ours, that its proposal excited much attention, and was discussed with the freedom, and, at the same time, with the deliberation, which so important a change demanded. The result of much and deep consideration was the adoption of that form, which has ever since been carried out with a degree of regularity, greater, perhaps, than could have been reasonably expected, when it is considered upon how many contingencies its periodical issue depends. The success of the experiment (for such it was at its commencement) has fulfilled the anticipations of its warmest advocates; and the satisfaction with which it has been received, not only by the Society, but by naturalists who were not of our body, both in England and abroad, has, I doubt not, contributed greatly to raise the character of the Society, to extend its usefulness, and in no small degree to increase our numbers by the accession of many a good working naturalist.

The most striking event, however, of the period of which I am

now speaking, was the removal of the Society from its old home in Soho Square to our present commodious and most desirable location; and in connexion with this important movement, our close approximation to the Royal Society, and the increased intercourse which we have enjoyed with that body since our juxtaposition. I think I may venture to say that all our most sanguine expectations, as to the advantages and pleasures of that relation, have been amply fulfilled. We have now enjoyed four years of prosperous occupation here, and in addition to the pecuniary advantage of immunity from rent, the increased accommodation in regard to space, and the greater convenience and beauty of our rooms, the success which has resulted from these circumstances in the scientific prestige which the Society has acquired, the great addition to our numbers and the increased extent and higher character of our publications, has shown how important to our welfare was the change which we then effected. This advantage has not, however, been enjoyed without an occasional cloud of doubt as to the duration of our occupancy; and it will be in the recollection of some present that I felt myself called upon in the year 1859 to allude in a particular manner to the proposals which were made, and which there was every reason to expect would be carried out, to cover the site of Burlington House and the vacant ground behind it, with buildings destined for the mingled occupancy of Government Offices, of Scientific Societies, and of the Royal Academy, and other institutions connected with art. This scheme is, for the present at least, abandoned; and we shall probably be left in undisturbed possession of our present abode for many years to come. The Royal Academy, by the recent extensive improvements in the present galleries, appear to have given up any idea of removing, and we shall be spared the threatened absurdity of the appropriation of the whole area in front of Burlington House, including the site of the present matchless colonnade, as a stand for carriages, useful only during the brief period of the Academy's annual exhibition.

If, however, the memorial of the last eight years present us with a general result of almost unprecedented prosperity, that period has been no less conspicuous in our history for the number and the melancholy importance of our losses by death.

In a Society so numerous as ours we must, according to the invariable statistics of mortality, annually have to lament the loss of many of our number, notwithstanding the length of life and of membership by which our list is distinguished, I believe, beyond

tian clergyman ought to do, that that religion is an imperfect one which stops short of exhibiting the great Object of our worship as the beneficent Creator of all that is pure and beautiful around us. His own love and enjoyment of nature was intense, and his benevolence was such that he could not be satisfied without enabling others, and especially the poor and children, to enjoy the same pleasure with him. There was, too, a remarkable unity and consistency, and, if I may so speak, a keeping in his character which is very rare. "The elements were so mixed in him," that whilst there was no excessive preponderance of any one quality at the expense of others, so there seemed to be no deficiency in any of those qualities which deserve and ensure universal respect and love, and which are essential to the completeness of the manly and Christian character.

I need not detain you by any detail of our scientific proceedings during the past year, as they are already, or will shortly be in your hands. It is sufficient for me to appeal to our publications and to your experience of the character of our meetings, to show that neither in regard to the scientific value of the papers read, nor to the interest of our conversational discussions, has there been any falling off from the progress which we have for a long time been enabled to record; and I believe that the Society has never evinced a more sound and healthy vitality than at the present time.

With regard to our financial position, which is so important an element in our prosperity, it is peculiarly gratifying to me to state that we have never been in a more satisfactory condition. At the last Anniversary, I mentioned that the last item of our bonded debt had just been paid off, but that payment had occurred too late to be included in the yearly account. It is therefore only in the Auditors' Report of the present year, that we have been able to announce our absolute immunity from the incubus of debt; whilst the balance in our hands is so considerable, that the Council has determined upon adding to the funded capital by the purchase of £200 in the Consolidated Fund. This is the first instance in which any sum has been funded by us, irrespective of legacies or other adventitious aid; and when this fact is considered in conjunction with the paying off of the only remaining item of our bonded debt, to which I have alluded, I cannot but heartily congratulate you upon so auspicious a fact, because there appears every probability that, in future years, the whole of the sums received in composition for annual payments may be similarly in-

vested. I need not say that it has always been my most anxious wish that this important object should be as soon as possible attained.

The independence of the Society and its free action can only be secured by the possession of a fund on which to fall back in case of any temporary suspension of prosperity, or of any contingent call for unusual or unexpected expenditure.

Although I have not thought it necessary to enter into any detail of our own corporate acts, I think it will be interesting to you to learn that in the completion of Mr. Bentham's 'Flora of Hongkong,' we have, I believe, the first example of a colonial flora published under the auspices of the Colonial Secretary, with Government aid, and that the first volume of the 'Flora Capensis,' by Dr. Harvey and Dr. Sonder, has also been issued with the assistance of the Cape Government. It is much to be desired that these examples of the publication of the Natural History of our Colonies under the auspices of Government should be followed out with a judicious and well-applied liberality.

The spread of the love and study of natural history, and its teaching by means of lectures and the formation of local museums, is as satisfactory in our English provinces as I last year described it to be in Ireland. At Leeds, the sum of nearly £8000 has been raised for enlarging and improving the museum belonging to the Literary and Philosophical Society, which, owing in great measure to the efforts of the Rev. T. Hincks, is rapidly acquiring importance. The collections there are both extensive and interesting. Two volumes of 'Transactions' have been published in former years. The County Museum at York is an admirable one, and very useful lectures are delivered there. At Newcastle-upon-Tyne, there is the nucleus of an excellent museum, "which," says my informant, "is extending by the efforts of some energetic young men, aided by a legacy from the late Robert Stephenson and donations from Sir William Armstrong and others. There is also a flourishing Microscopical Society, and other institutions having more or less the object of the cultivation of natural history." The Tyneside Naturalists' Field Club is a society of very respectable standing, and, as I have long known, admirably conducted. The number of members was at Christmas last no less than 345, and it is still steadily increasing. I have seen several parts of the 'Transactions,' which are highly creditable, and no papers are published but such as are strictly on local subjects. Similar institutions, as I am informed, exist at Manchester and some other places.

The well-known Literary and Philosophical Society of the last-named city still keeps up its character, and a Microscopical Society in the same place is also in active operation. The details of the working of the society, especially on the products of the deep-sea soundings, are highly interesting, and but from a desire not to detain you too long, I should have willingly devoted a few minutes to their enumeration.

At Alton in Hampshire, at Bedford, at Wakefield, and many other places distant from the Metropolis, as well as in the suburbs, societies having these objects are established; and even in the far Orkneys a Natural History Society is actively engaged, under the direction of the Rev. Mr. Stobbs, in forming a complete collection of local objects of natural history. If I glance at the vast improvements in Kew Gardens and the increased number of visitors there, as well as at the Zoological Gardens, I have laid before you sufficient proof of a vast advance in the popular recognition of Natural History as a rational source of enjoyment.

I return now, Gentlemen, to our more immediate interests. It had long been felt that considerable advantage might be anticipated from the appointment of a second secretary instead of the under-secretary recognized by the bye-laws, and that one of the two secretaries should be considered as representing the Zoological and the other the Botanical element in conducting the business of the Society. As this arrangement would require an alteration in the bye-laws, and as the whole of our code was thought to demand a revision, for which we were not at the time prepared, Mr. Busk kindly consented to act as the Zoological Secretary, under the title of under-secretary, until the retirement of Mr. Bennett from an office which he held for twenty years, with a zeal and constancy and talent which laid the Society under the deepest obligations to him, whilst his unfailing courtesy and kindness endeared him to every one who was brought into connexion with him. I hope I shall be pardoned a momentary digression, whilst I congratulate the Society and our friend himself upon his comparative restoration to health, and upon his being able once more to cheer us by his occasional presence amongst us, and in particular by his valuable assistance in the Council.

At this time Mr. Busk being elected Secretary, Mr. Currey allowed us the advantage of his services under the old title, until that alteration of the bye-laws, which you have recently confirmed, enables you this day to elect him as joint Secretary with Mr. Busk. It is not necessary for me to enter into any detail on the subject

of these alterations. They were made by the Council after the most mature deliberation, and I believe that every one who compares their present with their past state will acknowledge that every change has been an improvement.

The vacancy occasioned by the much-regretted retirement of Dr. Boott from the office of Treasurer, has been proposed to be filled up by the nomination of Mr. Wilson Saunders—an arrangement which needs no recommendation from me to secure the cordial approval of the Society. But, to my sorrow, I have to announce that, whilst retiring from office, Dr. Boott has also signified his desire not to be re-elected into the Council, a circumstance which will be felt by the whole Society as a serious loss.—After having acted as Secretary and as Treasurer for many years, during which his services in both capacities, and as a member of Council, were invaluable, whilst the gentle urbanity of his manners, his warmth of heart, and the never-failing interest he always took in the welfare of the Society caused him to be regarded with the deepest personal esteem and respect, his removal from a position which kept him, as it were, in continual and close relation to us, will be felt by us all as a very painful breach in our brotherhood.

Before I take my leave, Gentlemen, I cannot but advert for a moment to the very important duty which will devolve upon you this day—the choice of a new President. When, from circumstances with which I have no occasion to trouble you, I decided upon inflicting on myself the severe self-denial of requesting the Society not to re-elect me as their President at this Anniversary, I considered it my duty to confer with the Treasurer and some other of the older members of the Council as to the gentleman whom I should propose as my successor. The first consideration was, that he should be a Botanist, and it appeared to me and to my friends and consultees, that there could be no hesitation as to the distinguished person who should be proposed to the Council for their nomination. Mr. Bentham's extensive—may I not say unequalled?—knowledge of scientific botany is too well known to need any eulogy from me. We have all for years past been accustomed to listen with admiration to his papers in this room, and to the good sense and extensive information which he has thrown into our discussions.

But there is one claim which Mr. Bentham possesses to the suffrages of the Linnean Society in particular, on which no one is more entitled to speak than myself, and that is the remarkable

wisdom, knowledge of business, and tact which have always distinguished him in the Council, and for which I now beg leave to express most strongly my own obligations and those under which the Society at large lies to him. I hope Mr. Bentham will accept the assurance of my most earnest wishes that he may long continue to occupy a chair which he is so well able to fill; and that, while the Society enjoys the benefit and prestige of his Presidency, he may ever receive the same confidence, the same kind consideration, the same affectionate attachment, as that with which for the last eight years I have been honoured.

OBITUARY NOTICES.

The Secretary then read the following notices of deceased *Members*.

George Earl of Aberdeen, whose name for the last twenty-five years has stood at the head of the list of Fellows, died on the 14th December, 1860.

The well-known public character and career of this distinguished patron of literature and art, and the absence in him of any pretension to scientific fame, render it unnecessary here to do more than express the deep sense which this Society, in common with the whole British Empire, cannot fail to entertain of the great public loss sustained by the decease of one so long eminent as a statesman and so distinguished by the excellence of his public and private character.

Robert John Ashton, Esq., was by profession a solicitor, residing at Pelham Crescent, Brompton, and having chambers in New Inn. He was the eldest son of Robert Ashton, Esq., of Brompton, by Mary, daughter of J. A. Schwenk, Esq., and was born at Brompton in 1812. Educated by the late Rev. Dr. Lewis at Twickenham, he was admitted a solicitor in 1836.

As he was possessed of good independent property, he followed his profession more as a means of occupation than of profit, and in the exercise of his avocation the strong tendency of his mind to scientific and antiquarian pursuits led him to cultivate law as a science, and to investigate the intricacies of titles rather than to engage in active practice.

Mr. Ashton was a good classical scholar and well versed in the German and French languages; but the natural bias of his mind was better exhibited in scientific and antiquarian studies, and especially in that of natural history. Thus chemistry, botany,

entomology, geology and numismatics successively occupied his attention. He became a member of the Entomological Society in 1835, and contributed some valuable papers in the second and third volumes of its 'Transactions.' He was elected a Fellow of the Linnean Society in 1839.

Mr. Ashton was possessed, according to his biographer in the 'Law Times,' whence I have taken this short account of his life, of no ordinary mental powers, great originality of thought, and was familiarly versed in biblical lore. Of strong religious feeling, he took a lively interest in most of the popular religious societies of the day; at the same time he was a man of strict integrity, charitable, upright and uncompromising almost to a fault.

He died at Richmond, on the 26th of August, 1860, at the early age of 47, and was buried at Kingsbury, Middlesex.

Philip Edward Barnes, Esq., B.A., occupied the post of Danish Consul at Coquimbo. He was the son of Mr. Philip Barnes, an old Fellow of the Society, and one of the originators of the Royal Botanic Society, in whose service his son was at one time engaged as Assistant Secretary.

Mr. Barnes was elected into the Society on the 18th of December, 1838, and died at Copiapo, Chili, on the 2nd of October, 1860.

Bracy Clark, Esq., the "Father of the Linnean Society," died on the 16th of December, 1860, at the advanced age of 90, having retained his faculties in almost full vigour to the last. In his own profession he was esteemed one of the most eminent, if not the most eminent, of veterinarians. At any rate, he was one of the first in this country to apply the resources of a liberally educated and well-informed mind to the study of the veterinary art, which, since the establishment of the college, has deservedly been admitted into the rank of a profession. He was born at Chipping Norton, in Oxfordshire, on the 7th of April, 1771, the ninth and last child of his parents, who belonged to the Society of Friends, and both of whom died within a few weeks of each other, before their youngest-born was two years old. He was left under the guardianship of a near relative, Mr. John Zachary, and at 8 years of age was placed at school at Barford, where he had a favourable opportunity of acquiring classical knowledge, and had among others for contemporaries, Luke Howard and Sampson Hanbury—names since as much distinguished as his own in their respective walks.

When 14, he was apprenticed to a surgeon at Worcester, under whom and his successor, he continued to improve his classical knowledge, and acquired a practical acquaintance with the art of

medicine. During this period, he took great interest in chemical and mechanical pursuits, and is said to have constructed several ingenious machines.

His earliest predilection in natural history was for the study of entomology, and he made an extensive collection of the insects found in the neighbourhood of Worcester; but though he was doubtless animated by a strong love for this branch of knowledge, the scientific principles by which he was guided are not very obvious, when we find it recorded that he would not admit any insect into his collection but such as had been described by Linnæus; any new forms apparently being regarded by him as unauthorized interlopers. To entomology he soon added botany, as it was then understood, as an object of pursuit; and these tastes appear to have been beneficial to him in more ways than one; for besides the useful and instructive training his mind thus received, his pursuits were the means indirectly of introducing him to a more refined and intelligent, or at least more learned society, than might otherwise have been accessible to him.

At the end of his apprenticeship, and when he had reached the age of 21, Mr. Clark proceeded to London, with a view, apparently, of pursuing his medical studies. Through his guardian, Mr. Zachary, he was introduced to the notice of Sir Joseph Banks, under whose auspices, probably, he was elected a Fellow of this Society on the 15th of January, 1793—that is to say, within about five years of its foundation.

His medical studies were commenced under John Hunter, whose place, however, in Windmill Street, was about that time supplied by Sir E. Home, and he had for fellow-students amongst the famous dead, Thomas Young, Anthony Carlisle, Abernethy, and Astley Cooper, and of the illustrious living Mr. Lawrence, who still remains amidst us in almost unimpaired vigour and activity of mind and body. But, although Mr. Clark appears to have regularly attended the medical classes, his choice from an early period was to devote himself to the veterinary art, to the practice of which his medical and scientific studies were the best possible introduction. To this he was incited by his elder brother Mr. Henry Clark, who was a lover of horses, and noted in the sporting circles. In the pursuit of his special branch, he early attached himself to the Veterinary College, about that time established in St. Pancras, and into which Mr. Clark used to mention with delight, that he officially led the first horse as a patient.

In the year 1797, he resolved to visit one of his sisters, who was

married and settled at Lausanne. On the passage to Hamburg, however, in a Yarmouth packet-boat, the vessel was captured by an American privateer, and taken into a Dutch port, where the passengers received some hard treatment, and were robbed of all they possessed, though Mr. Clark's loss fortunately does not appear to have been heavy. He remained on the Continent for about two years, and travelled through Holland, Denmark, Germany and Switzerland at a time when travelling was not quite so easy as in the present peaceful times; and many testimonials are extant of the consideration he obtained among men of science for his industry, intelligence, and energy. Having in vain endeavoured to obtain permission to enter France with the view of studying at the celebrated veterinary schools of Paris and Lyons, he returned to England, and commenced practice in London, where he soon attained the most eminent position in his profession. In the course of his practice he appears very early to have felt that it was out of the natural order of things that horses should, after some years' usage, so often become *lame*, a term under which he included every defect in stepping, and in the detection of which he possessed a very keen eye. In his 'Hippodamia,' he has left a very interesting account of his researches into the cause of this lameness, which were rewarded by a discovery, in his own estimation at any rate, "second to none that has ever been made on the subject of horses." This was what he termed the "principle" of the elasticity or expansibility of the animal's foot. This so-termed "principle," however, had been previously recognized by Mr. Freeman in his work on the 'Mechanism of the Horse's Foot,' which was published in 1796. At the present day, we can only wonder that so obvious a fact should ever have been overlooked by the most barbarous farrier, and that it should have been reserved for the last sixty or seventy years to erect it into a "principle."

The application, however, of this "principle" in the shoeing of horses seems to have been a more difficult problem than its discovery, and to have engaged the attention and laborious ingenuity of many veterinarians. Mr. Clark was occupied more or less in the solution of the question up to the last year of his long life, and, in fact, his experiments in this regard appear to have absorbed no small portion of the very considerable gains he made by the practice of his profession. His zeal in this subject we cannot perhaps wonder at, when we learn that, in his opinion, the horse would attain to the age of fifty, were it not for the cruel sufferings occasioned by the imprisonment of its feet, the cutting of the *frog*,

and the otherwise cruel treatment experienced by it at the hands of smiths in general.

Among Mr. Clark's published works should be enumerated, first, his papers published in our 'Transactions,' consisting of 1. "Observations on the Genus *Œstrus*," which was read November 1st, 1796, and published in the third volume of the 'Linnean Transactions.' 2. "Of the Insect called *Oistros* by the Ancients, and of the true Species intended by them under this appellation; in reply to the Observations of W. S. Macleay, Esq., and the French Naturalists: to which is added a Description of a new Species of *Cuterebra*" (*Ibid.* vol. xv. pp. 402–411); and 3. "An Appendix or Supplement to a Treatise on the *Œstri* and *Cuterebræ* of various Animals" (*Ibid.* vol. xix. pp. 81–94; and Proc. Lin. Soc. vol. i. pp. 99–100). The "Observations on the Genus *Œstrus*" were republished in an amplified form, in 1815, under the title of 'Essay on *Œstri*.'

Mr. Clark's first appearance as an author, however, was in the 'Gentleman's Magazine,' where he gave "A short Account of the celebrated Race-horse Eclipse," which was written in so lively and pleasing a style as to attract considerable attention.

Among his numerous other works may be mentioned his elaborate treatise on the 'True Structure and Economy of the Horse's Foot;' his 'History of the Veterinary Art;' a 'Treatise on the Bits of Horses;' and a 'Memoir on the Vices of Horses;' an 'Essay on the Knowledge of the Ancients respecting the Art of Shoeing the Horse;' all of which, to borrow the words of his biographer in the 'Edinburgh Veterinary Review,' "testify to his untiring perseverance, devotion to veterinary science, and his profound knowledge of the subject."

To conclude in the words of the same writer, who is far better entitled than I am to express an opinion, "Few men have had the privilege of working or writing in true earnest for the length of time that Bracy Clark laboured in the cause of veterinary science. The progress in the purely scientific department of that profession in this country during the last seventy years has been due almost entirely to Bracy Clark. The reputation of British veterinarians on the Continent is mainly attributable to his efforts."

William Henry Fitton, M.D., F.R.S., F.G.S., died on the 13th May, 1861, at the advanced age of 82. Though never a contributor to our 'Transactions,' no man was better known or more warmly esteemed than Dr. Fitton in all scientific circles. Justly eminent among geologists, he may be regarded as one of the earliest and

most zealous founders of the British School of Geology. His early labours, commencing more than half a century ago, on the geology of Hastings and its neighbourhood, and these, together with his works on the strata intervening between the chalk and oolite in the South-east of England and in the Isle of Wight, published as they were at an early period in the history of the science, speedily raised Dr. Fitton to a European reputation, which was not only maintained, but enhanced by his subsequent career.

In 1827 he became President of the Geological Society, in which capacity he was the first to set the laudable and useful example, since so amply and ably followed by his successors, of giving an annual *résumé* of the general progress of the science. In 1852 he received the Wollaston Medal, presented to him by the Society for his eminent scientific services. Besides his strictly scientific publications, Dr. Fitton contributed several articles on the early history of geology to the 'Quarterly Review' and other periodicals.

John Stevens Henslow. As I feel that it would be impossible for me to do equal justice to the subject of the following notice, or to express in anything like such adequate terms what is due to the memory of Professor Henslow, I have thought it better, with the due permission, to insert in the records of the Linnean Society, the eloquent and complete account of his life and labours contained in the pages of the 'Gardeners' Chronicle' for June 1, 8, and 15, 1861.

"There are few men whose loss will be more generally deplored, whether as a clergyman or as a man of science, than the subject of this notice; nor are these his only claims to be regarded as a benefactor of his race, for there are few whose personal influence for good on the social, moral, and religious characters of those with whom he has been associated or laboured, has been so deeply felt or so gratefully acknowledged. To give even a sketch of the varied attainments and personal qualifications that were so blended in Prof. Henslow as to render him at once the most popular and useful man of science of his day, is quite impossible here; for they depended on a combination of rare qualities of head and heart; each natural, but all well trained and conscientiously cultivated by their possessor during a long period of his life. Amongst them, however, should be mentioned some personal and other features, which, as being in a great measure due to temperament and mental endowment, were inherent and characteristic of all periods of his life: these were a sense of truth and fair play, so instinctive, that deception or even reticence when the cause of truth was at stake

were things almost unintelligible to him; a geniality of disposition that rendered him an attractive companion from his childhood upwards; a temper of which he was never known to lose command, even by his most intimate friends; an organization of brain that rendered all subjects of study equally easy of acquirement; a keen love of nature and of natural knowledge, and ardour in communicating it; a quick perception, excellent powers of generalisation, the largest charity, a total absence of vanity or pride, a winning countenance, and a robust frame. Few men indeed were more gifted by nature to take a commanding position in the many spheres of life, in one or other of which he was always busy; few had more need of that balance of powers of mind which his University tutors recognised as something unusual, and the phrenologists accounted for by the form of his head, which they considered faultless. That this is no exaggerated estimate of the subject of this sketch, the following brief notice of his career will prove.

"He was born on the 6th of February, 1796, at Rochester, where his father was in business as a solicitor, the eldest of eleven children, of whom four sisters only survive him. His scientific powers and love of natural history, which were very early displayed, were inherited both from his father, who was a great reader of natural history books, and devoted to the observation and keeping of birds and other animals, and from his grandfather, Sir John Henslow, surveyor of the navy, who united to a scientific knowledge of naval architecture, great ingenuity and skill in designing. He was educated first at a free school in Rochester, and afterwards at Dr. Jephson's, of Camberwell. During the former period he delighted in making excursions on the Medway, and especially in hunting for insects, and in rearing them and observing their habits. It was during the latter period that he first learned how to arrange and systematize; and the delight in analysing, understanding, and illustrating, gradually equalled that of collecting; and these were thenceforward the ruling passions of his life.

"In 1814 he was entered at St. John's College, Cambridge, and graduated as 16th Wrangler in 1818, in which year also he joined the Linnean Society. During his college career he continued an active naturalist; declining to compete for the much higher academic position which, with his mathematical powers, he might easily have attained, he preferred substantial knowledge, studied chemistry under Prof. Cumming, mineralogy under Dr. Clarke, laboured hard at geology as an original inquirer with but little aid, and became a Fellow of the Geological Society in 1819.

"In 1821, at the early age of 23, he appeared as an author, communicating to the Geological Society his 'Supplementary Observations on Dr. Berger's Account of the Isle of Man,' containing a map and sections, to the preparation of which he had devoted his spare time whilst spending two long vacations on that island with pupils. At about that period the same duties also led him to the Isle of Anglesea, the geology of which he diligently explored, and embodied the results in a most elaborate paper, printed in the first volume of the 'Cambridge Philosophical Transactions.' This paper not only at once raised its author to a very high position, and caused such a demand for the volume in question that it was soon out of print; but it is to this day quoted by geologists as a model of truthful and sagacious scientific research. It possesses also rare merit, as combining with great power of co-ordinating physical features, skill and accuracy in the application of chemistry, mineralogy, mathematics and drawing to the illustration of a very complicated mountainous region.

"At this period, too, his physical powers were equal to his mental; and during his geological excursion in Anglesea he once walked 40 miles in the day, with his hammer and specimens on his back, and danced all the following night at a ball!

"About the same year Professor Henslow took up botany with the same zeal and method which he had devoted to other branches of science, being, it is believed, first attracted to morphology and physiology. He soon, however, found that no satisfactory knowledge of these branches could be acquired without a previous acquaintance with systematic botany; and this, joined to his ardour for collecting, led him to the formation of a herbarium, in which he displayed not only the specimens, but the structure of their organs, their relations, variations, and aberrations. In 1822 the Professorship of Mineralogy becoming vacant, he became the successful candidate; he held the appointment for three years, conscientiously devoting the whole of his time to the study, and especially to the chemical and crystallographical branches of it, for which his mathematical powers and previous training eminently qualified him. He prepared and published an admirable syllabus of his course of lectures, followed by a systematic list and analytical tables, drawn up with the same scientific precision and clearness that characterize all his labours.

"In 1825 the Professorship of Botany became vacant by the death of Professor Martyn, and for this Professor Henslow resigned the mineralogical chair; applying all his energies and ma-

nifold acquirements to his new post (which had been wholly neglected for many years), and speedily raising it from obscurity to renown. He immediately arranged a course of lectures at once scientific, practical and popular, gave chemistry and physiology their legitimate places in botanical teaching, and, by applying his mathematical powers in giving a prominent place to the geometrical problems involved in phyllotaxis, he awakened interest in a study to which some of the mathematicians of Cambridge had hitherto hardly accorded the dignity of a science. Nor did he neglect the more practical duties of a teacher; no one knew so well as he did that to make botanists of students they must quickly be brought to believe that in some directions, at any rate, they can and ought to walk unaided; he therefore took them on excursions, taught them early how to name plants by an artificial use of the natural method; gave each confidence in his earliest efforts, and led them on by example, teaching and encouragement. Nor did botanists and undergraduates alone profit: his lecture room was attended by senior members of the University, and his excursions by entomologists, conchologists, and geologists; each deriving knowledge in his own speciality from him, and he from them: thus exciting amongst his pupils an admiration for his manifold acquirements that was only equalled by their love of his personal character.

"For 14 years Professor Henslow resided at Cambridge as botanical professor, during which period the income attached to the chair was very small; this was, however, no obstacle to his instituting weekly evening meetings at his own house for the reception of every one interested in science, including under-graduates; to which all were invited to bring specimens of interest in any branch of science; and at which there was free intercourse between young men and 'dons' of every degree. This practice, previously unknown in the University, and, we regret to say, as yet unfollowed, was a step of immense importance in diffusing a taste for science, no less than in inciting the young men to intellectual pursuits.

"During this period he contributed two papers to the Cambridge Philosophical Society on a hybrid *Digitalis*, and the structure of the Mignonette, both of the highest merit as works of philosophical research, and which established his reputation amongst continental naturalists: he also wrote the volume on Botany for Lardner's 'Cabinet Cyclopædia,' an admirable little work, of which two editions have been sold, and a third was under revision at the time of his decease. It is a noticeable fact, that since Professor

Henslow's departure from Cambridge, not a single botanical paper, and very few on other branches of natural history, have been contributed to its Philosophical Transactions, of which he was one of the founders.

"In 1823 Professor Henslow married a daughter of the Rev. George Jenyns, of Bottisham Hall, in Cambridgeshire; and in 1825 he took orders as curate of Little St. Mary's, in Cambridge. In 1833 he was presented by Lord Brougham, then Chancellor, to the Vicarage of Cholsey-cum-Moulsford, in Berkshire, where he resided during the summer months of three years, passing the rest of his time at Cambridge as before. In 1837 he was transferred by the Crown to the valuable Rectory of Hitcham in Suffolk, and there from 1839 until his death, he resided throughout the year, with the exception of six weeks of the Easter term, when he lectured during the week in Cambridge; for many years returning to Hitcham for the Sunday service.

"To the duties of his new position Professor Henslow brought the same energy, and the same love of bettering his fellow-creatures as had distinguished him in Cambridge, together with increased fervor for teaching, matured faculties, and a deep sense of his responsibility in ministering to the spiritual and temporal wants of a large and wofully neglected parish. His flock were notorious for belief in witchcraft, drunkenness, poaching, sheep-stealing and other immoral habits; they consisted of field labourers living in wretched hovels, and of farmers, who, being intellectually little better than their servants, were doggedly opposed to any change in their moral or physical condition. Here was work requiring all Professor Henslow's indomitable energy and multifarious resources; no one knew better than he what is the result of throwing good seed on stony ground, and he consequently laid his plans for tilling and fertilizing the ground committed to his culture with such sagacity and skill, and carried them out with such unflinching steadfastness of purpose, that within less than a quarter of a century he reaped his reward hundred-fold, and died with a harvest garnered. It is quite impossible to estimate the amount and kind of moral courage required for a clergyman to break down the sturdy opposition to change of the farmers of twenty years ago; but his neighbours had to do with one who never determined on a plan of action without carrying it into successful effect, and whose downright honesty, frank bearing, and imperturbable temper, were weapons proof against the outbursts of prejudice, avarice, and malice with which he was assailed.

"On Professor Henslow's arrival at Hitcham the parish consisted of upwards of 1000 persons, scattered over more than 4000 acres; and the poor-rates amounted to 27*s.* per head, women and children of all ages included! Moreover parish relief was not unfrequently levied by bands of 40 or 50 able-bodied labourers, who intimidated the previous rector into instant compliance with their demands. The church was all but empty, and baptism and the marriage ceremony were practically regarded as superfluities or luxuries; whilst with regard to food, clothing, and the means of observing the decencies of life, the inhabitants were far below the average scale of the peasant class in England. His first step was to attach the labourers to himself, and induce them to regard him as a friend. For this purpose, being a capital pyrotechnist, he invited them to the rectory lawn in the evening and amused them with fireworks, and then gradually introduced to their notice many simple objects of domestic use hitherto unknown to them; and having once gained their confidence he lost no time in setting to work on a plan that should tell at once both on their bodies and minds; knowing well that it would be necessary to raise their condition to that of rational beings, and secure some feeling of independence among them, before he could act with effect on the class which held them in bondage. To this end he caused a school-room to be built, and a mistress appointed—both on a very humble scale, for he had but slender support from his parishioners; indeed, greatly as the building and the stipend of the mistress are now increased, it has been mainly through his liberality; his subscriptions having often doubled those from all other persons. In the school he so arranged the method of teaching, that the sympathies as well as the faculties of the children were aroused by a combination of the religious and secular elements. The children were taught their duty to God, to one another, and to themselves; the latter by means that were long thought Utopian, but are now recognized as efficacious beyond precedent; we allude to the introduction of Natural History as a means of sharpening the observing and reasoning faculties, and giving the children an increased reverence for their Creator's power, a knowledge of common objects, and a pursuit in which they can take equal interest in the fields or at home.

"Professor Henslow's method of teaching village children botany, and the success that has attended it as an educational measure, quite apart from the information given, have often been noticed; it is now the theme of universal praise, it has been taken up by

the Council of Education, and is being carried out in various parts of the country. We cannot here dwell on its manifold advantages to an agricultural people, how it influences their daily habits in after-life, as well as advances their material interests as rearers of vegetable produce; and we must refer to the numerous volumes of the 'Gardeners' Chronicle' in which accounts have appeared, some by Professor Henslow himself, of the working of these and other educational and social measures.*

* As an exemplification of the methods employed by Prof. Henslow for the gaining of the affections, and amusing and instructing the minds of his humbler parishioners, we subjoin the following interesting sketch of some of the pleasures of a visit to Hitcham about eight years since, which appeared in the 'Literary Gazette' of July 9, 1853, from the able pen of Mr. Lovell Reeve.

"A VILLAGE FLOWER-SHOW.

"In a quiet corner of rural England dwells a pastor of the Established Church —an eminent teacher of botany—whose educational views, sprung from a mathematical university, have bent with peculiar grace to the influence of his professional pursuits. For him the lilies of the field are as ministering elements of thought and feeling, serving to rear up the minds of his flock in notions of comeliness and order; and to draw lessons from plants and other natural objects, is with him a treasured step towards the development of an observant and godly intellect. Let us see how far his village flower-show of Wednesday last, more pleasurable after its kind than even the glories of Chiswick, confirms the spirit of his teaching.

"The ruling principle of the 'H——— Labourers' and Mechanics' Horticultural Society,' is, that every member should feel his independence as a contributing subscriber. They are of the very poorest class. Few, very few, alas! of the parents are able to read or write. The subscription is *sixpence per annum*, and out of this small fund two annual shows—one of flowers and one of vegetables—are held with great rejoicing in the grounds of the Rectory. Prizes varying from 2*s.* 6*d.* to a pinch of white snuff—*i. e.*, peppermint lozenges—are offered by the rector, gentry, and farmers, to the most successful cultivators, and the award of the judges is looked forward to each year with as much competing excitement as the gold and silver Banksian and Knightian medals of the metropolis. There is, however, one important advantage which this Society has over those of London. It gives prizes for Wild Flowers. Here, Flora is not so drugged, and forced, and tricked out with hoops and flounces. Her meretricious adornments of paint and patchwork are unknown in the pastoral village of H——. Her botanical charms are here fresh and uncorrupt. She doesn't linger in heated rooms, and come forth an unblushing jade, all blossom, with her retiring mantle of foliaceous green cropped to the shortest possible dimensions. She breathes the atmosphere of heaven, lurks beneath the tinkling sheep-bell, peeps out modestly from the hedgerows, and is plucked by tiny hands for the sake of the lessons she gives. As the seasons come round, the children of H—— go into the fields to gather wild flowers, and a faithful record is kept and printed of the parish flora. Hard names, such as monocotyledonous and inflo-

"In 1838 ploughing matches were introduced, and applauded by the labourers; it might have been supposed by the farmers too; but with characteristic obstructiveness they for many years continued to throw in the apple of discord, and rendered fair play impossible. Upon this Professor Henslow took higher grounds, and

rescence, are as familiar to them as household words. They are engrafted on the memory by their continual practical illustration. The spelling-book gives them names equally hard and important, such as ple-ni-po-ten-ti-a-ry and ag-grand-ize-ment, but as these things are unfamiliar and have no practical illustration among them, they are forgotten almost as soon as learned. Of Wild Flowers, a prize of 1*s.* and four of 6*d.* are offered for the five best nosegays, not exceeding 18 inches by 12, prepared by children between eight and fourteen years of age; and a prize of 1*s.* and two of 6*d.* for similar nosegays from children under eight years of age; and three prizes of 2*s.* 6*d.*, 2*s.* and 1*s.* 6*d.* are offered respectively to the children of the parish school who shall answer best some questions about the local wild flowers. There is, however, an important N.B. in the corner of the prospectus. The children who compete for botanical honours must have received a ticket for regularity of attendance at either Day or Sunday School.

"The day approaches, and great are the preparations at the Rectory. On the broad green lawn, skirted with lofty elm trees,—God's house in the distance,—are being erected tents and booths, round-abouts and see-saws. The ladies, ever forward in works of charity and kindly encouragement, are preparing all sorts of embellishments—flags of divers patterns, not intended to brave the battle, but only the breeze, and rosettes of economical pseudo-satin, pinked to perfection, to dignify the stewards; and it is whispered that the servants are preparing a surprise. All that is to be seen in the kitchen at present are the little bags of Congou, milk, and sugar, in solution, brewing in a mash-tub; and mountains of good brown cake sufficient for a feast of ogres. The day arrives, and the village botanists are sauntering up the long walk with the produce of their rambles. Presently they are buzzing under a group of horse-chestnut trees, making up their nosegays—eighteen inches by twelve—and anon they show them in the exhibition booth, in the quaintest possible stands—from a ginger-beer bottle to a cocked-hat Damon of the time of Watteau, with his arms akimbo, looking as proud of his load as a Linnæan herbalist. Opposite to them are arranged the fuchsias, geraniums, roses, pinks, stocks, pansies, annuals and perennials, nosegays and device nosegays, and at the end the rustics are peeping with astonishment into a polyorama and a stereoscope. On the opposite side of the green is a tent devoted to general curiosities. Eggs of alligator, and eggs of ostrich, eggs of humming-birds, and eggs of some other wonderful birds incubating lilliputian cottages in yolk of shells and moss, casts of Echini in their flinty matrices and Echini in chalk, vegetable ivory, from the nut to its process of turning into pin-cushions and umbrella handles, ammonites and nautili, bright enamelled shells of all kinds, butterflies and scorpions, grasses and sedges, lace bark and chocolate in the pod; but it is beyond our memory to enumerate the specimens of this instructive museum, all set out and stored away again in one day by the busy Professor in his St. Albans hat of plaited straw. The company has arrived, and probably eight hundred or more, some in fustian and coarse print, some in surtout and gros-de-naples, are assembled on the lawn, the carriage gentry

matured his plans for extending a system which would strike at the root of agricultural slavery, and for which he had been for ten years struggling with but very slender success: this was the allotment system, which from the time of his first proposing it, had met with the fiercest and best organized opposition. To pro-

driving up to the house to exchange congratulations with the host and hostess. The servants have brought out their surprises. Upon the booth is seen a triumphant display of loyalty,—'God save the Queen,' in daisies of emblematic white upon a laurel background. Over the door is a monster vegetarian, the counterfeit presentment of an agriculturist, spade and fork in hand, built up of laurel leaves, be-buttoned with daisies, and with a face rudely made out of jocund roses. Lastly a richly laurelled throne is brought out, something between a sentry-box and a pulpit, and into this the Rector-Professor mounts to distribute the prizes. The giving of each prize is accompanied with praises and criticism, according as either is needed. The fuchsias are pronounced to be excellent, the pinks not so good. 'You must improve their cultivation,' said the Professor, 'by the next show. In having such jagged edges they look too much like cloves. They look as if they had been jumping through the brambles and had torn their petticoats.' The failing characteristic was understood in a moment. The wild-flower gatherers now stand round to receive their prizes, and to be asked questions. It was announced that one little girl had added twelve new species to the flora of Hitcham during the past year,—twelve, not brought haphazard with a heap of others, but detected separately in the field as not being in the printed catalogue, and not hitherto known to the University Professor of Botany as being inhabitants of his parish. Plants from the West of England, not before seen by the little botanists, were then shown to them, and the class, family, and genus were told without hesitation; and when asked to what plant known to them they were related, the allied local species was named, though differing in general aspect. The plant was determined alone by its scientific characters. The prizes were awarded, and it did one's heart good to see the little bob curtsy and intelligent simper that accompanied it. A present of botanical boxes was promised to be given on the morrow. The banquet of tea and cake for the three hundred horticulturists who had taken penny tickets, and a hymn of loyalty and grateful interchange of huzzas between master and servants, concluded the proceedings. The parting adieu is still tinkling gently in our ear.

"But a yet more interesting sight awaited us. On the morrow we visited the parish dame-school. The forms were crowded with children, the girls neat and intelligent, the boys somewhat quaintly clad and drowsy. As the Professor appeared at the door, also a little quaint, in his straw hat, with a rough hoe for a walking-stick, the pinafored botanists, who seemed to congregate by instinct, stood up to receive him. At one end of the room was a cupboard, overlooked by a print of Joseph cast by his brethren into the pit, containing the parish herbarium. It consisted of dried specimens of the flora of Hitcham, neatly arranged and named, and outside on a board hung the printed catalogue of reference. Opposite to it was a large A B C table and some views of the Crystal Palace. At the other end of the room was the vivarium or collection of living specimens. Each plant

vide the labourer with the means of improving his condition, and secure to him as an irrefragable right, what alone offered a prospect of keeping him from the workhouse when unemployed by the farmer, and from the beershop when disposed to be idle, was an object worth every effort on the part of the rector; and in 1849, by dint of his indomitable moral courage and determination, he succeeded in establishing no fewer than fifty quarter-acre allotments in the parish. For several years the battle raged, but with the aid of one or two staunch supporters—honourable exceptions to the mass—he overcame all difficulties, and finally almost tripled the number of allotments. Throughout the whole of this agitating period Professor Henslow preserved not only a calm, but a conciliatory bearing: he announced himself from the first as a champion of the rights of the poor, sought no quarter himself, but gave it liberally to all the vanquished; he printed and circulated

was contained in a separate phial of water, and two or three hundred or more, all fully labelled, were arranged along the wall in wooden shelves drilled for their reception. The prizes awarded to the most successful field botanists were now brought out for distribution. They were of three classes—botanical boxes, pocket lenses, and cases of forceps. The little villagers received their philosophical instruments with a shrewd appreciation of the use of them, and brought them to bear on a dissection of the products of the day with the dexterity of a Hooker or a Lindley. The forceps was lifted to separate the sepals and petals, the lens to examine the number of pistils and stamens, and class, order, and genus were determined by the competing botanists in a moment. 'They beat my Cambridge boys,' said the Professor. 'We don't trouble ourselves here about the Artificial system of botany; we jump smack to the Natural.' One little girl had detected a species of reed grass new to her. It was new, as occurring in this locality, to the Professor. It was new even to his own private herbarium, and rare in all England. A liberal pinch of white snuff from Pandora's box was the welcome reward. The girls were now examined as to the general characters of plants. A specimen was held up and systematically pulled to pieces, and the questions put were promptly answered in the course of the dissection. All we can ourselves remember is a lifting of the forceps, a quizzing through lenses, a general consultation and whispering, and the simultaneous echo now and then of such words as 'tetradynamous,' 'hypogynous,' 'polypetalous,' 'syngenesious,' and the like, learned out of a printed formula, which, owing to the assistance of the bountiful goddess hereinbefore mentioned, had proved much easier to them than the multiplication table. 'They beat my Cambridge boys hollow,' again remarked the Professor, with a smile. In conclusion, all kneeled down on the clean brick floor, to repeat a short prayer to the gracious Giver of plants that open out spring lessons for intelligent minds, and we went out thoroughly impressed with the importance of nature-teaching, even in this sequestered pastoral spot. We would have given the world at that moment for some claim to a share in the blessing that followed the Reverend Professor home to the Rectory."

one sharp rebuke addressed to the farmers, which informed them of his intention of abiding by his own resolves, and declining their dictation. The success of the allotments is now complete, and the Hitcham allottees have on several occasions distanced all competitors in the excellence of their produce.

"We cannot here do more than allude to the various well-organized methods by which Professor Henslow gradually raised the condition of the people committed to his charge, and which, without one exception, were flourishing at the period of his decease. Of these the 'Recreation Fund' has naturally been the most popular; it originated in his suppression of the annual tithe dinner given by the rector to the farmers in one of the public-houses, and which was always a scene of disgraceful drunkenness. In 1849 he announced his determination to withhold the money for this purpose, and to employ it in giving an excursion in which the best-conducted of his parishioners should join: short excursions in the neighbourhood excited a desire for more distant ones, and by means of a small subscription amongst themselves, aided by larger ones from the rector's family and some well-wishers to his plans, journeys to Ipswich, Norwich, Cambridge, the Exhibition of 1851, Kew, Harwich, and Felixstow, were organized and carried out at the expense of a few shillings per head. On these occasions Professor Henslow often printed and circulated plans of the route, with illustrations that should serve for reminiscences of the chief objects worth seeing: he arranged with the railway directors for cheap trains, and with public and private individuals for admission to interesting places; and most generously were his exertions everywhere seconded by all parties. The plans all arranged, time-tables opened, and, with tickets in their hats, nearly two hundred villagers would assemble at dawn to enjoy throughout the day the simple and instructive discourse of one whose engaging voice never failed to draw a crowd of hearers of all ages. It is a well-authenticated fact, that, though the rustics were on all such occasions unfettered in action throughout the day, and often thirsty and exposed to temptation, there never occurred an incident of which any could be ashamed; at the termination of the day, or perhaps deep in the summer night, they would return orderly and happy to their homes, without an absentee. After one of these trips (that to Cambridge), the farmers of the parish, unable to withhold any longer some expression of admiration, united in presenting him with a silver cup.

"We need not further refer to the village festivals and horticul-

tural shows, which have often been described, nor to the prizes given for garden produce, honey, nosegays of wild flowers, and good cultivation, together with the simultaneous amusements provided for all ages in tents on the rectory lawn, the addresses, *lecturets*, parting counsels of wisdom, and chorus of 'God save the Queen.' Nor is this the place to go into the details of the 'Wife's Society,' the 'Coal Club,' the 'Medical Club,' 'Children's Clothing Club,' 'Loan Fund,' and a number of other successful expedients to encourage the villagers in practices of mutual charity, and, at the same time, habits of self-dependence. All these and much more, have been often detailed in the local papers, and in none better than the Suffolk Chronicle.

"To the neighbouring towns of Bildeston, Hadleigh, Ipswich, Bury St. Edmunds, and Sudbury, Professor Henslow most liberally extended his services in diffusing knowledge to all classes, and by every means in his power. In London he lectured but once, and then to the junior members of the Royal Family; all other invitations he refused, on the ground that there was no excuse for scientific destitution in the metropolis, and that he must economise his resources for his own neighbourhood and university. When invited by H.R.H. the Prince Consort to give a short course of lectures at Buckingham Palace, he gladly did so; with characteristic modesty attributing the selection of himself to a desire on the part of the Prince to recognize his efforts in school teaching (which would be of the greatest service towards extending his usefulness), rather than as marking his appreciation of Professor Henslow's position as a man of science. These lectures were delivered *vivâ voce*; they were in all respects identical with those he was in the habit of giving to his little Hitcham scholars; and the same simple language and engaging demeanour that had proved irresistible in the village, won over his Royal audience to fixed attention and eager desire for instruction.

"With the exception of Cambridge, no town owes so deep a debt of gratitude to Professor Henslow as Ipswich, whose unique museum was planned and arranged by him, and made the model of what a local museum should be in a scientific, educational, and popular point of view. He so grouped all natural objects that enough was exhibited to teach, but not so much as to confuse; and the ingenuity, judgment, and science with which he did this for all branches of knowledge, have never been even rivalled. To a certain extent the same services have been rendered to the Cambridge Botanical Museum, where, however, his efforts

were frustrated for want of space : at the Royal Gardens, Kew, he has been more successful, and the museums there owe much of their admirable method of mounting, illustrating, and ticketing, together with many valuable objects, to his unequalled talents for such work. His practice throughout life was to give the best of everything to public museums, and to retain duplicates only for himself.

"The Great Exhibition of 1851 deeply interested him, and there were few departments of it with the contents of which he was not perfectly familiar. To the succeeding Exhibition at Paris he communicated a most beautiful series of Carpological illustrations, which excited the enthusiasm of the Paris botanists, and of which a duplicate set is now in the South Kensington Museum ; where also are sold his admirable botanical diagrams for schools, with a little guide to their use, and his method of teaching botany in schools.

"For a considerable period of his life he worked with zeal at British antiquities, in which he became learned and expert, himself opening several tumuli, the contents of which he described in two tracts with illustrations. The fragments of glass, pottery, and Samian ware from these and other quarters, some of very large size, were all neatly and accurately restored by his own hands, and the best presented to the museum of Colchester.

"Every room of his large rectory, from hall to attic, presented a marvellous assemblage of instructive objects of interest, beautifully mounted with descriptive labels, to attempt conveying any idea of which would be utterly hopeless ; besides botanical and zoological specimens, economic, physiological and structural, without end, there were series illustrating many important arts and manufactures of savages and civilised beings, ancient and modern: linen, cotton, shoes, hats, candles, glass, pottery, silk, &c., all beautifully packed in boxes, and ready for use when needed. Fossils, antiquities, models of ships and machines, orreries, microscopes, weapons, crystallographical series, and philosophical apparatus of all kinds ; besides diagrams, drawings, and classified woodcuts, of which he had literally thousands, mounted and instructively arranged in classes ; and all independent of his library and excellent British entomological, conchological, and tertiary fossil collections. Let it not be supposed that these were the miscellaneous hoardings of a mere collector ; there was not one specimen that had not attached to it its history, nor that was not obtained and mounted for a purpose, and that was not in use at one or other of his frequent lectures, or placed at the service of his scientific friends.

"Tertiary geology and the recent changes of the earth's surface

before and since man's appearance, had, perhaps, a more absorbing interest for Professor Henslow than any other subject. Few persons more deeply studied and more boldly preached the Bible, or more stanchly upheld the doctrines of the Church of England; but he ever maintained the necessity of appealing to the spirit rather than to the letter of the written Word, in all cases where the established facts of science appeared to contradict the text of Scripture. In spiritual matters he avowed the total insufficiency of human reason unaided by revelation; but having witnessed many changes of theological opinion brought about by progressive discoveries in history and science, he was very averse to speculative reasoning where these were not in apparent harmony with revelation.

"His charity was nowhere more conspicuous than in his intercourse with those who differed widely, and often publicly, from himself in religious opinion. He never sought to gloss over these differences, nor did he allow of any misconceptions with regard to their true nature: but he never permitted them to influence in the smallest degree his conduct, or to diminish his admiration for what was honest and good, wherever he found it. Hence he discussed such polemical questions as the age of the globe, the origin of species, &c., with such ingenuous forbearance, that inquirers of all denominations and professions turned to him for a calm and unprejudiced judgment.

"As may be supposed, the flint implements in the drift deeply occupied his attention: on first hearing of them (their human origin he never doubted), he was disposed to be wholly incredulous as to their antiquity, and published his opinion on the subject: this was no wonder, considering how many mares' nests of the kind he had seen exposed, and himself aided in exposing. Nothing hampered by his avowed scepticism, he, with characteristic devotion to truth, earnestly took up the subject, twice visited Hoxne, where he had excavations made which resulted in a modification of his first view; he then visited the pits at Amiens and Abbeville in the autumn of last year, studied the localities and country around, the museums and collections in the neighbourhood, and returned with his views still further modified though not wholly altered. Up to the time of his last illness he was busy on this subject, comparing his observations with those of others, and studying the results, which he was preparing to lay before the Cambridge Philosophical Society. Of what his final conclusion was, no record has been published; but we believe that he had convinced himself

that the flint implements belong to a period long antecedent to that usually attributed to man's existence on the earth, though by no means so distant as some geologists suppose.

"But it would be difficult to point out any branch of science in which Professor Henslow did not take an active interest; he attended the first meeting of the British Association, and was ever afterwards a stanch supporter, and frequently an officer of this body; he was one of the first examiners in the University of London, and till his death a distinguished member of its council; he actively aided the Society for the Diffusion of Useful Knowledge, the Ray Society, and the Palæontographical Society, and was a most liberal contributor to the various charities and funds for the relief of the needy members of his own profession and naturalists in general. To poor authors, especially, he was a most generous subscriber, nor was he ever appealed to in vain in any cause the justice and expediency of which were duly authenticated.

"At several periods he took a most important part in public politics, being an active member of a party who pledged themselves to suppress that system of bribery for which the town of Cambridge was long so justly infamous; and though few of his University and scientific friends sympathised with him on these occasions, his conduct was so typical of his singleness of purpose, firmness of character, and abhorrence of foul play, that this portion of his career cannot be overlooked even in a brief review of his life.

"On one occasion in particular, when no one else of sufficient position and character would come forward, he had the moral courage to brave, not only the public odium (for which in a just cause he never cared much), but the disapprobation of many of his most intimate friends, and offer himself as the nominal prosecutor in a case of gross corruption. In doing this he was actuated by a feeling of duty to his country, and beyond it he did not interfere; neither attending the trials or committees, nor subscribing to any of the proceedings. The amount of abuse he received may be estimated by the fact, that upwards of a quarter of a century afterwards he smilingly pointed out to a friend the words 'Henslow, common informer,' on the walls in Cambridge, where they are still legible. His services were, however, deeply appreciated at the time, for he received three handsome testimonials, one from the town of Cambridge, another from the Town Committee for the suppression of corruption, and the third from a committee of noblemen and gentlemen; all alike testify to the perfect disinterested-

ness, moral courage, and consummate ability with which Professor Henslow conducted the duties he volunteered for. It has been erroneously stated that he received the living of Hitcham as a reward for these services. Such, however, was far from the case; he was made aware, indeed, that he was considered entitled to government patronage, but, with conscientious disinterestedness, he declined to avail himself of the offer. On the death of the previous rector of Hitcham he was recommended by the Bishop of Ely (formerly tutor to Lord Melbourne) as being the man who, in that prelate's opinion, was best calculated by his ability, activity, and common sense, to reform that populous, remote and wofully neglected parish, where the duties of squire, magistrate and rector must all fall upon the latter.

"Amongst the most remarkable instances of a direct benefit conferred upon agriculture through scientific knowledge, was his discovery of the use of the phosphate nodules which abound in the tertiary formations of the Eastern counties. On the discovery of the nature and origin of those petrified animal remains, their value to the farmer was instantly apparent to Professor Henslow, who at once gave his discovery the widest circulation in the local papers, without reservation of any kind; claiming no credit, no reward, no consideration even as the discoverer. This was indeed heaping coals of fire on the farmers' heads, to whom this discovery continues to be a source of incalculable wealth, large areas of Norfolk, Suffolk, and other counties, being now honeycombed with phosphate pits; yet up to the day of Professor Henslow's death, no acknowledgment even was vouchsafed of his services. In the same liberal spirit he printed and circulated his volume of letters to the farmers of Suffolk, which pointed out and stimulated them to use methods which have largely increased the products of their holdings.

"Though the professional career of Professor Henslow as the spiritual guide of his parishioners is a subject unsuited to our columns, yet it is right to state that his duties as pastor superseded all others in his estimation; and though they were eclipsed in public opinion by his more conspicuous labours, and though he had the greatest aversion to a parade of religion, he was ever assiduous in spiritual duties—so much so, that for fifteen years he was not absent from Hitcham for a single Sunday.

"But want of space forbids our going further into the philanthropic or scientific career of this most amiable, learned, and excellent man; a volume might be filled with the incidents of his

ever-busy and well-spent life, during which he was incessantly occupied for others rather than for himself; and with anecdotes of his noble qualities of head and heart. We can only allude to his efforts, not completely successful until near the close of his life, to establish in Cambridge the scientific tripos and degrees in science, and to develop the University Herbarium and Botanical Garden, with their Library and Museum, to which he for 30 years very largely contributed from his private means, and to which he gave all his own botanical collections. To the University his loss is as disastrous as it is irreparable; whether as a member conspicuous for his varied accomplishments and genial nature, or as a teacher, and most especially as not only the best, but the only man altogether qualified to direct the scientific, educational, and practical arrangement of its new museum.

"During the last few years of Professor Henslow's life his health had become seriously impaired; incessant mental and manual labour, habitually protracted beyond midnight, and the want of proportionate daily exercise, gradually undermined his once robust constitution; though he was always abstemious and temperate in every respect. About five years ago he complained of considerable derangement of lungs or heart, which was attributed by his medical attendants to defective digestion. In March of the present year, though feeling far from well, he left home to pay some visits in the south of England, where he caught a violent cold, which was followed by bronchitis and congestion of the lungs and liver, which alarmingly aggravated his heart symptoms. He returned to Hitcham on the 24th, when he rapidly grew worse, and was soon confined to a bed of protracted suffering, which he never quitted till his death on the 16th of May.

"Professor Henslow desired to be interred in the churchyard at Hitcham, and that his funeral should be of the simplest description, and none but his parishioners employed; his wishes were strictly attended to, but a considerable concourse of strangers found their way to that remote village, and, together with a deputation from the town and corporation of Ipswich, paid their unobtrusive tribute to the memory of one whose rule of life was the motto of his family—'Quod videris esto.'"

Thomas Hoblyn, Esq., F.R.S. and *M.R.I.A.*, was late Chief Clerk in Her Majesty's Treasury. He died on the 6th of August, 1860, in his 83rd year, having been a Fellow of the Linnean Society since the 4th of March, 1823.

Edward F. Kelaart, M.D., F.G.S., was a native of Ceylon, of what

is there called "burgher" parentage; that is to say, descended from the early Dutch colonists, a race that of late years, under the liberal government of Ceylon, has produced many individuals of merit in the professions of law and medicine. His father was employed in the military medical department, and the son was thence afforded favourable opportunities of acquiring the rudiments of science. In these studies he was much encouraged by the late Henry Marshall, Deputy Inspector-General of Hospitals, and from whose precepts and example he derived the habits of study and arrangement by which he was distinguished. Early in life he visited England to prosecute the study of medicine and surgery, and having obtained his diploma, he was, in 1841, appointed Staff Assistant Surgeon in Her Majesty's Forces. Being stationed in this capacity at Gibraltar, he diligently collected and arranged the plants of that singular promontory. The results of these labours appeared in 1846 under the title of "*Flora Calpensis*, or Contributions to the Botany and Topography of Gibraltar;" a small and unpretending, but highly meritorious and useful work.

Dr. Kelaart subsequently returned to Ceylon, and for several years busied himself with the Fauna of that magnificent island. He also published an extended catalogue of its productions, which forms a valuable addition to the knowledge of its natural history.

His impaired health constrained him on two occasions to return to England, and on his last return to Ceylon in 1856, he was engaged by the late Governor Sir Henry Ward in observing and investigating the Natural History of the Pearl Oyster, the fishery of which is of considerable importance in the revenue of the island. Some of the results of this investigation have appeared in an 'Introductory Report on the Natural History of the Pearl Oyster of Ceylon,' published at Trincomalee in 1857.

He had also previously published at Columbo, in 1852–4, a 'Prodromus Faunæ Zeylanicæ,' of which he presented the first, and the first part of the second volume, to our Library.

Being subsequently recalled to England, he died suddenly of disease of the heart, during the passage, on the 31st August, 1860, in his 42nd year.

Frederick Perkins, Esq., F.G.S. & H.S., the head of the eminent firm of brewers in Southwark, died on the 10th of October, 1860, in his 81st year, at Chipstead Place, Kent. He was elected a Fellow of the Society on the 13th of March, 1816.

Francis Plomley, M.D., was a physician of considerable repute at Maidstone, where he died, after a long illness, on the 9th of

January, 1860, in the 55th year of his age; having been a Fellow of the Linnean Society since the 4th of March, 1845.

Dr. Plomley began life as a general practitioner at Lydd, on Romney Marsh, but on his becoming an Extra-Licentiate of the Royal College of Physicians in 1846, he removed to Maidstone. In 1849 he much distinguished himself by his courage and self-devotion in the treatment of a fearful epidemic which broke out among the Irish hop-pickers congregated at East Farleigh, in the neighbourhood of Maidstone. Regardless of danger and fatigue, he devoted himself for sixteen days and nights, almost without intermission, to his painful task, in conjunction with Mr. Sedgwick, Mr. Kennett, the Union Surgeon, and the then Incumbent of the parish, the Rev. Archdeacon Wilberforce. In 1850, Dr. Plomley was appointed Physician to the West Kent Infirmary.

Notwithstanding his professional occupations, he always found time to devote considerable attention to natural history, and especially to ornithology; and during his residence on Romney Marsh he made a valuable collection of Kentish Birds, comprising not less than 516 specimens, all preserved and set up by himself. This interesting collection, which was always liberally open to the public, he eventually presented to the Dover Museum, where it is shown as the "Plomley Collection." Dr. Plomley's published works are of no great importance, consisting chiefly of lectures addressed to the Weald of Kent Farmers' club in the years 1849–51, on subjects of natural history, interesting to the agriculturist. They are:—

1. A Lecture on the Structure, Functions, and Chemistry of Plants.

2. Observations on the Laws which regulate the Growth and Cultivation of Grain and Root Crops.

3. On the Blights of the British Farm, arising from Parasitic Fungi.

4. On Hop-Blights; including the Natural History of the Hop-Fly and its Enemies.

These praiseworthy attempts to enlighten his neighbours on scientific subjects very necessary for them to be acquainted with, are all highly creditable to Dr. Plomley, and the last Essay more especially appears to contain some interesting original observations.

Francis George Probart. M.D., was a physician of considerable eminence at Bury St. Edmunds, in which town he had long occupied a very prominent position, and was much and deservedly

respected by all classes. He died suddenly on the 25th of April 1861, aged 79, having been a Fellow of the Linnean Society for 33 years.

Edward Rigby, M.D., one of the most eminent among London obstetrical physicians, was born at Norwich on the 1st of August, 1804, the son of Dr. Edward Rigby, of that town, who attained great celebrity by a valuable "Essay on Uterine Hemorrhage" and other works.

Dr. Rigby was one of twins, and it is a curious circumstance, often adverted to by himself, that he was one of six children born at two births, his mother at a subsequent confinement having produced four.

His education was commenced at the Grammar School of Norwich, then directed by the Rev. Dr. Valpy, and among his schoolfellows were Sir James Brooke and Sir Archdale Wilson. He was afterwards placed with the Rev. James Layton, at Catfield in Norfolk, where, however, he did not remain more than two years, and at the age of 17 he attended the practice of the Norfolk and Norwich Hospital, and in the same year had the misfortune to lose his father. He afterwards proceeded to Edinburgh, where he graduated, receiving his diploma on his 21st birthday. Subsequently Dr. Rigby pursued the study of his profession in Dublin, Berlin, and Heidelberg, where, from the kindness of Professor Nægeli, he enjoyed ample opportunities for improving his knowledge of obstetric medicine. Professor Nægeli's instructions and scientific knowle dgewere so highly valued by his pupil, that Dr. Rigby undertook a translation of the Professor's pamphlet on "The Mechanism of Parturition," which was published in London in 1829.

In the same year he became a house-pupil at the Lying-in Hospital in the York Road, to which Institution he was afterwards first junior and then senior physician. In 1831 he passed the College of Physicians and commenced practice in London, where his professional abilities at once placed him in a prominent position. As a teacher, he began as Lecturer on Midwifery at St. Thomas's Hospital, but in 1838 he was appointed to the Midwifery Chair at St. Bartholomew's, where he continued to lecture for ten years, when the pressure of his professional engagements compelled him to retire. For nineteen years he occupied the position of Examiner in Midwifery in the University of London, vacating it only a few months before his death, which took place on the 27th of December, 1860, as a loving biographer in the 'Medical Times' remarks, "scarcely full of years, but full of honours."

William Somerville, M.D., died on the 25th of June, 1860, at Florence, in his 92nd year, being thus one of two nonagenarians who have departed from among the Fellows of the Linnean Society in the past year.

He was formerly one of the principal Inspectors of the Army Medical Board, and Physician to the Royal Hospital, Chelsea.

James Forbes Young, M.D., was born in April, 1796. He was a magistrate and deputy lieutenant for Surrey, and an eminent medical practitioner in Lambeth, having succeeded his father in practice in the year 1836. His early education was conducted at the Charter House, and he afterwards became a student of medicine at Guy's Hospital, whence he proceeded to Edinburgh, where he graduated in 1817. His unwearied industry and talents, combined with his amicable and conciliatory disposition and deportment, naturally led to a great extension of the practice he had inherited from his father, and justly secured him the love and esteem of all who had occasion to consult him, or came within the sphere of his friendship. Like many others in his profession, he loved natural science, and was distinguished by his ardent zeal in the cultivation of botany and geology. Early in life he began the formation of an *herbarium*, which is said to be rich in British plants collected and arranged by himself. He also devoted much time and attention to, and was very successful in the cultivation of ferns, of which plants he had perhaps one of the choicest collections in the neighbourhood of London. In Geology his attention appears to have been chiefly devoted to the study and collection of chalk fossils, of which he possessed an extensive and fine series. In addition to these professional and scientific pursuits he was no mean antiquarian, and had made a considerable collection of prints relating chiefly either to history or topography, and he had himself profusely illustrated editions of "Grainger's Biographical History of England," "Pennant's London," and the "History of Lambeth and Charter House,"—his own "*alma mater*," besides other works of a more miscellaneous character.

Two years before his death his useful and laborious career was interrupted by an attack of paralysis, from which he never wholly recovered, and, gradually declining, he died on the 30th of June, 1860, and was buried in Lambeth churchyard, which also contains the tombs of the "three Tradescants, grandsire, father and son," restored some years ago under Dr. Young's superintendence.

In our list of Foreign Members we have to lament the loss of one of the oldest and most famous of European Zoologists, the

venerated M. Duméril, who died on the 14th of August, 1860, after a short illness, at the advanced age of 86, universally honoured and beloved.

Andre-Marie-Constant Duméril, Member of the Institute and Commander in the Legion of Honour, was born at Amiens in the year 1774. At an early age he devoted himself to the study of Medicine, and so soon distinguished himself, that in 1793, when only 19, he was appointed Prévôt d'Anatomie at Rouen. In 1798 he was admitted to the degree of Doctor of Medicine in the University of Paris, and was nominated Chef des Travaux Anatomiques in that Capital, an office for which he had competed successfully with Dupuytren. In 1801 he was raised to the chair of Anatomy at the Faculty of Medicine, which in 1822 he resigned for that of Physiology, to be in turn exchanged, in 1830, for that of internal Pathology, which he held till his death. In the early part of his career he appears to have been also actively engaged in the practice of Medicine, and in 1804 was appointed by the Emperor Napoleon, in company with M. Desgenettes, on a mission to study the yellow fever in the South of Spain,—a dangerous duty, to which he devoted himself with the zeal and energy which he displayed on all occasions and on all subjects.

But notwithstanding these professional occupations, M. Duméril's attention was from the first principally directed towards zoological science, to various departments of which his chief works alone belong.

In 1800, under the direction of Cuvier, he assisted in the editing of the first two volumes of the 'Leçons d'Anatomie Comparée' of that great anatomist, who never failed on all occasions to acknowledge the assistance he had derived from his able and industrious coadjutor; by whom also he was succeeded in the chair of Natural History in the École Centrale of the Panthéon*.

In 1802 he was deputed by M. de Lacépède to deliver the lectures on Herpetology and Ichthyology at the Jardin des Plantes, a mission which M. Duméril continued to fulfil for more than fifty years, at first as the substitute for M. de Lacépède, and afterwards as titular Professor of those subjects. To his zeal and industry in this office, not only is the Museum indebted for the creation both of the best collection of objects belonging to Herpetology

* In a notice of M. Duméril's works, it should not be omitted that he was perhaps the first to perceive the analogy of structure which exists between the vertebræ and the bones of the cranium; a theory which for the last forty years has exercised the ingenuity of so many.

ever brought together, and of living specimens in the Menagerie of Reptiles, but the scientific world at large owes the production of the great work on Herpetology, the 'General History of Reptilia,' which, at first in conjunction with his friend and pupil the late lamented M. Bibron, was in progress for a period of twenty years.

The scientific labours of M. Duméril, continued through an almost unparalleled length of years with unabated vigour and success, have crowned his name with universal fame, and his deserts have been acknowledged in the various honours bestowed upon him. In 1816 he was chosen a member of the Academy of Sciences (Section of Anatomy) in place of M. Tenon, and received the decoration of the Legion of Honour in 1837, in which illustrious Corps he was raised to the rank of Commander a short time before his death. His honoured name was added to the list of our Foreign Members in 1854.

In his zoological works he displayed great descriptive and analytic powers, delighting in precise and lucid definitions, and in attention to systematic classification. At the same time, however, like Buffon and Pallas, Reaumur and De Geer, and many others of the most illustrious zoologists, he devoted much time to the study of the habits of animals, the record of which adds so much not only to the scientific value, but to the popularity and interest of zoological works. The subjoined list of M. Duméril's principal works, though I fear very imperfect, will still serve, better than anything else, to show how his valuable labours were continued and varied during a longer life than falls to the lot of most, and continued moreover, it may be said, with increasing value and importance to the last. His first work left the press in 1797, when he was but 23; and his last, a quarto of 1336 pages, appeared almost simultaneously with his decease at the patriarchal age of 86.

Few can show such a career of usefulness, and of no one can it be more truly said that in its course he never made an enemy. Distinguished as M. Duméril was in science, in moral worth he was equally eminent. Devoted in friendship, amiable towards his colleagues, paternal towards his pupils, benevolent towards all men, void of jealousy or envy towards rivals,—his praise was always ready where it could be bestowed, and his encouragement wherever it was needed.

The following are the principal works for which science is indebted to M. Duméril:—

1. Dissertation sur l'Organe de l'Odorat, et sur son existence. dans les Insectes. 1797.

2. Traité élémentaire de l'Histoire naturelle. 1804; 2nd ed. 1830.

3. Zoologie Analytique, ou Méthode naturelle de Classification des Animaux. 1806.

4. Mémoires de Zoologie et d'Anatomie Comparée. 1807.

5. Sur le developpement de la Chaleur dans les œufs des Serpens (Mém. de l'Acad.).

6. Dissertation sur les Poissons qui se rapprochent le plus des Animaux sans Vertèbres. 1812.

7. Dissertation sur la Famille des Poissons Cyclostomes, pour démontrer leurs rapports avec les Animaux sans Vertèbres. 1812.

8. Considérations générales sur la Classe des Insectes. 1823.

9. Erpétologie générale, ou Histoire naturelle des Reptiles. 1834–54 (in conjunction with his friend and disciple, M. Bibron).

10. Prodrome de la Classification des Reptiles Ophidiens. 1853.

11. Ichthyologie Analytique; ou Essai d'une Classification naturelle des Poissons. 1856.

12. Entomologie Analytique. 1860.

The Secretary also announced that twenty-three Fellows, one Foreign Member, and one Associate, had been elected since the last Anniversary.

At the Election which subsequently took place, George Bentham, Esq., was elected President, W. W. Saunders, Esq., Treasurer; and George Busk, Esq. and Frederick Currey, Esq., Secretaries. The following five Fellows were elected into the Council, in the room of others going out:—viz., M. P. Edgeworth, Esq., John Miers, Esq., Daniel Oliver, Esq., Lovell Reeve, Esq., and P. L. Sclater, Esq.

It was moved by Dr. Boott, and seconded by Mr. Saunders, that the best thanks of the Society be given to Professor Bell, for his invaluable services to the Society during the eight years he has occupied the President's chair. That the Society gratefully acknowledges the unvarying courtesy and kindness with which he has discharged the duties of the office, and fully recognizes the zealous interest he has taken in the welfare of the Society and in the promotion of its objects; willingly attributing to his efforts much of its present prosperity and increased usefulness, as displayed in the large number of new Fellows, the value and greater frequency of its publications, and the satisfactory state of its finances.

It was moved by Mr. Bentham, and seconded by Mr. Saunders, that the thanks of the Society be given to Dr. Boott, on his retirement from the office of Treasurer, with an expression of the Society's deep regret on losing his valuable services in that capacity.

Mr. Bennett, on the part of the auditors of the Treasurer's accounts, read the balance sheet, by which it appeared that the total receipts during the past year, including a balance of £415 14*s.* 3*d.* carried from the preceding year, amounted to £1,566 13*s.* 1*d*; and that the total expenditure during the same period amounted to £1,121 10*s.* 8*d.*; leaving a balance in the hands of the bankers of £445 2*s.* 5*d.*

June 6th, 1861.

George Bentham, Esq., President, in the Chair.

The President nominated Thomas Bell, Esq., J. J. Bennett, Esq., J. D. Hooker, Esq., M. D., and W. W. Saunders, Esq., Vice-Presidents for the ensuing year.

Read, first, "Notes on *Caryophylleæ*, *Portulaceæ*, and some allied Orders;" by George Bentham, Esq., Pres. L.S. (See "Botanical Proceedings," vol. vi.)

Read, secondly, "Further Remarks on Scansile Appendages to the Feet of Insects;" by Tuffen West, Esq., F.L.S. (See "Transactions," vol. xxiii., Part 2.)

Read, thirdly, "Catalogue of *Hymenopterous Insects* collected by A. R. Wallace, Esq., in Ceram, Celebes, Ternate, and Gilolo;" by Frederick Smith, Esq., Assistant in the Zoological Department, British Museum. Communicated by W. W. Saunders, Esq., V.P.L.S. (See "Zoological Proceedings," vol. vi.)

June 20th, 1861.

George Bentham, Esq., President, in the Chair.

Senjee Pulney Andy, Esq., M.D., John Thomas Head Cotsell, Esq., and Peter Jones, Esq., were elected Fellows.

Professor Huxley, F.R. & L.S. exhibited a specimen of *Hyalonema mirabilis*, the property of Mr. Veitch (to whom it had been sent by his son from Japan), and made some explanatory observations.

General Sir John Hearsey, C.B., F.L.S., exhibited a collection of new or rare insects made by himself in India: also drawings illustrative of the transformations of Indian insects.

Sir Charles Bunbury, Bart., F.L.S., exhibited a flowering specimen of *Æsculus indica*, from Barton Hall, Suffolk. The tree raised from seed in 1851.

Dr. Carpenter, F.R. & L.S., exhibited the cocoons of the Tusseh Silk-moth of the Deccan (*Saturnia Mytilla*), from which silk is extensively manufactured at Wurrumgul, in the Nizam's dominions.

Read, first, "Notes on *Malvaceæ* and *Sterculiaceæ*;" by George Bentham, Esq., Pres. L.S. (See "Botanical Proceedings," vol. vi.)

Read, secondly, "On *Fissicalyx* and *Prioria*, two recently published genera of *Leguminosæ*; by the same. (See "Transactions," vol. xxiii. Part 2.)

Read, thirdly, "On the Discovery of *Carex Ericetorum*, Poll., as a native of Britain;" by C. C. Babington, Esq., M.A., F.R.S. & L.S., Prof. Bot. Univ. Camb. (See "Botanical Proceedings," vol. vi.)

Read, fourthly, "On three Oaks from Palestine;" by J. D. Hooker, Esq., M.D., F.R.S. & L.S. (See "Transactions," vol. xxiii. Part 2.)

Read, fifthly, "On some species of Oak from North China, collected by W. F. Daniell, Esq., M.D., F.L.S.;" by William Carruthers, Esq., F.L.S. (See "Botanical Proceedings," vol. vi.)

Read, sixthly, "Upon the Nerve proceeding to the Vesicles at the base of the Halteres; and on the subcostal Nervure on the Wings of Insects;" by J. B. Hicks, Esq., M.D., F.L.S. (See "Transactions," vol. xxiii. Part 2.)

Receipts and Payments of the Linnean Society from May 1, 1860, *to April* 30, 1861.

	£	*s.*	*d.*
Balance in the hands of the Bankers at last audit	415	14	3
Admission Fees	120	0	0
Compositions	330	0	0
Annual Contributions of £2 2*s.*	54	12	0
Do. do. of £3	519	0	0
Penalty of Bond (J. F. South, Esq.)	20	0	0
Transactions and Journal sold	85	11	1
Dividends on Consols	8	12	6
Contribution to Removal Fund	5	0	0
Donation from Daniel Hanbury, Esq. (Cost of plate in Linnean Transactions)	8	3	3
	£1566	13	1

	£	*s.*	*d.*
Insurance	15	2	0
Repairs and Furniture	11	11	0
Coals, Gas, Tea, Postage, &c.	96	10	9
Salaries	170	0	0
Printing, Engraving, &c.	655	1	0
Books purchased	26	2	4
Bookbinding and Stationery	27	3	10
Bond paid off, with Interest	108	0	0
Commission	11	19	9
Balance in the hands of the Bankers	445	2	5
	£1566	13	1

F. BOOTT, *Treasurer.*

The foregoing Accounts have been examined, and the Balance in hand found to be correctly stated at £445 2*s.* 5*d.*

May 20, 1861.

THOMAS BELL, *President.*
JOHN J. BENNETT, V.P.
JOHN HOGG.
W. WILSON SAUNDERS, V.P.
J. S. BOWERBANK.
GEORGE BUSK.

JOURNAL OF THE PROCEEDINGS

OF THE

LINNEAN SOCIETY OF LONDON.

Description of a curious Form of *Dipterous Larva*. By E. Hart Vinen, Esq., M.D., F.L.S.

[Read Feb. 21, 1861.]

In the early part of the year 1855, while examining with the microscope some water taken from a pool near my house at Bayswater, I noticed some small animals moving about with an active wriggling motion, which, as I believe them to be peculiar, I venture to introduce to the notice of the Society. They were very few in number, and I mounted some specimens in Canada balsam for future observation.

My first casual examination gave me the idea that they were mere larval conditions of some insect; a belief which was strengthened by the most prominent feature of the animal—a beautiful tuft of hairs (possibly respiratory organs) at the tail—and under this impression they were put aside with some other objects, but in consequence of more pressing occupation were for a long time neglected.

I have since consulted several entomologists, and finding their opinions to coincide with my own, I have thought it might be useful to give the following description:—

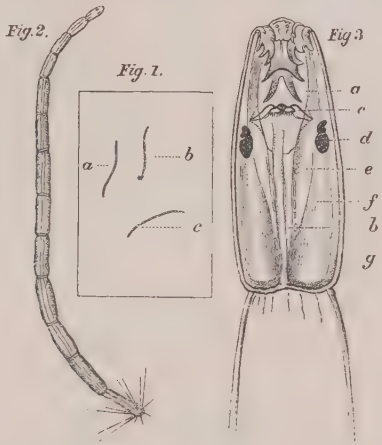
Body composed of thirteen segments, the four anterior comparatively short; cephalic joint narrow, truncated in front; eye-spots

double, placed near the lateral margins and below the anterior third of the segment. Caudal segment furnished with twelve spines or setæ, eight long and four short; the former being retroverted and disposed in pairs, alternating with the latter, which are somewhat nearer the extremity.

In addition to these characters, I may remark that the head appears to be supplied with a complicated buccal apparatus, but the preservative medium has rendered the parts so transparent that I refrain from hazarding a precise description of its several parts. Moreover, in different examples these appearances are dissimilar, whilst the cephalic segment itself is proportionally longer in some cases than in others. The eye-spots are always distinct, more or less elongated, each evidently consisting of two separate pigment-masses, the line of demarcation being clearly defined. In the specimen figured *a* on the slide, the eyes are much more elongated and more uniform in outline; being, nevertheless, thicker behind than in front. Connected with the eyes and buccal apparatus there are two laterally disposed muscular masses, which almost fill up the longitudinal halves of the cephalic segment. The buccal cavity itself is tolerably well defined, being funnel-shaped and apparently closed behind. The œsophagus takes its origin at the upper and back part of the sac, immediately behind a peculiar form of dental apparatus which guards the pharyngeal opening. This structure forcibly reminds one of the gastric teeth found in decapodous Crustaceans, and appears to consist of a central and two lateral horny pieces, which, acting upon one another, serve to comminute the food only partially broken up by the buccal organs. The intestinal canal can be traced throughout the entire series of segments, and on either side of it runs a conspicuous vessel filled with highly coloured blood. I have not observed any trace of reproductive organs, a circumstance which alone renders it highly probable that we have to do with a larval insect. The last or thirteenth segment is considerably narrower than those of the body proper. The eight *long* spines are jointed at the base, where they are comparatively thick, becoming gradually attenuated towards the tip; the segment itself is also slightly increased in breadth at the lower end. The length of each spine is somewhat less than that of the caudal segment, and fully four times longer than those of the smaller series placed nearer to the end of the segment; these latter project at a right angle from the tip, and do not appear capable of retroversion.

In the above description I have purposely refrained from entering into very minute particulars, owing to the imperfection observable in my preserved specimens. I have ventured, however, to relate these few particulars, hoping at some future time to analyse more accurately fresh and living examples, should I have the good fortune to meet with them.

I cannot conclude these remarks without expressing my thanks to my friend Dr. T. Spencer Cobbold for his excellent drawings, from which the accompanying figures have been copied.



DESCRIPTION OF CUT AS REDUCED.

Fig. 1. Three larvæ (*a*, *b*, *c*), of the natural size.

Fig. 2. The specimen marked *c*, ×8 diameters.

Fig. 3. Cephalic segment of the specimen (marked *a*) : *a*, buccal cavity; *b*, œsophagus; *c*, pharyngeal teeth; *d*, eyes; *e*, muscles of the mouth and pharynx; *f*, muscles to the eyes; *g*, integument showing a double contour, × about 70 diameters.

Feb. 21st, 1861.

Catalogue of the Dipterous Insects collected at Gilolo, Ternate, and Ceram, by Mr. R. Wallace, with Descriptions of New Species. By Francis Walker, Esq., F.L.S.

[Read Feb. 21, 1861.]

Gilolo.

Fam. TIPULIDÆ, *Haliday*.

Gen. Limnobia, *Meigen*.

The following species belongs to Meigen's Div. D. *Diptera*, vol. i. p. 122, pl. 4. f. 15.

1. Limnobia euchroma. *Fœm.* Læte ochracea, antennis, abdominis fasciis quatuor pedibusque nigris, alis nigricantibus, halteribus apice nigris.

Female. Bright ochraceous; antennæ black, setaceous, submoniliform, minutely setose, a little longer than the head; abdomen with four black bands, 2nd band much broader than the 1st and than the 3rd, the latter angular in front, 4th band much broader than the 2nd; legs black, slender; wings blackish; veins and knobs of the halteres black. Length of the body 6 lines; of the wings 12 lines.

Fam. STRATIOMIDÆ, *Haliday*.

Gen. Ptilocera, *Wied*.

2. Ptilocera 4-dentata, *Fabr*. See Vol. I. p. 7.

Gen. Stratiomys, *Geoffr*.

3. Stratiomys cinctilinea, n. s. *Fœm.* Nigra, capite anthracino nitente, peristomatis lateribus, antennis basi, scutelli dentibus duobus abdominisque margine flavescentibus, pedibus halteribusque flavis, alis subcinereis.

Female. Black; head coal-black, shining; peristoma yellowish on each side; antennæ yellowish at the base, much shorter than the breadth of the head; thorax with slightly gilded pubescence; scutellum with two pale yellowish teeth; abdomen with a narrower yellowish border; legs and halteres yellow; wings slightly cinereous; veins black. Length of the body 4 lines; of the wings 7 lines.

Gen. Clitellaria, *Meigen*.

4. Clitellaria bivittata, *Fabr*. See Vol. I. p. 7.

Gen. Sargus, *Fabr*.

5. Sargus tarsalis, *Walk*. See Vol. V. p. 274.

6. Sargus tibialis, *Walk*. See Vol. V. p. 273.

Gen. Massicyta, *Walk.*

7. Massicyta cerioides, *Walk.* See Vol. III. p. 78.

Gen. Solva, *Walk.*

8. Solva hybotoides, n. s. *Mas et Fœm.* Nigra, antennis basi pallide flavis, thoracis lineis lateralibus scutello abdomine pedibusque luteis (*mas*) aut flavis (*fœm.*), abdominis disco fœm. nigro, tibiis posticis nigris, alis cinereis.

Male and Female. Black; mouth and palpi pale yellow; antennæ lanceolate, shorter than the breadth of the head, pale yellow at the base; thorax with a humeral callus and an elevated line along each side and the scutellum luteous in the male, pale yellow in the female; pubescence slightly gilded; abdomen luteous, disk black in the female, with the exception of the hind borders of the segments; legs luteous in the male, pale yellow in the female; hind femora incrassated; hind tibiæ black, curved; middle tibiæ black in the middle; wings cinereous; veins black; halteres pale. Length of the body 3–4 lines; of the wings 6–8 lines.

Fam. ASILIDÆ, *Leach.*

Subfam. Dasypogonites, *Walk.*

Gen. Dasypogon, *Fabr.*

9. Dasypogon solutus, n. s. *Mas.* Niger, capite thoraceque auratis, antennis linearibus, thorace vittis quatuor pectoreque fasciis duabus nigris, abdomine rufo clavato apicem versus piceo fascia basali nigra, pedibus halteribusque rufis, alis cinereis apice nigricanti-cinereis.

Male. Black; head with pale gilded tomentum; epistoma flat, with a few pale bristles; eyes with very small facets. Antennæ linear, nearly as long as the breadth of the head; thorax and pectus with pale gilded tomentum; thorax with four black stripes, the lateral pair short, broad, obliquely intersected; pectus with two black bands; abdomen red, clavate, with a black band near the base, the four last segments with slightly piceous disks; legs red, robust; femora with a few stout black bristles; tarsi black towards the tips; wings cinereous, blackish cinereous towards the tips and along the adjoining part of the hind border; veins black, tawny at the base; halteres red. Length of the body 7 lines; of the wings 12 lines.

10. Dasypogon semifilatus, n. s. *Fœm.* Niger, capite thoraceque auratis, thorace vittis quatuor latis pectoreque fasciis duabus nigris, abdomine clavato fasciis tribus anticis fulvis, pedibus rufis, alis cinereis, halteribus flavescentibus.

Female. Black; head with gilded tomentum, cinereous behind; epistoma flat, with two pale bristles; palpi short; antennæ mutilated; thorax and pectus with gilded tomentum, the former with four broad black stripes, the latter with two black bands; abdomen clavate, about twice the length of the thorax, very slender towards the base, where it is dilated; fore part with three tawny bands, 3rd band interrupted in the middle, dilated on each side; legs red, slender; tarsi black; posterior femora and tibiæ with a broad black middle band; wings cinereous; veins black; halteres yellowish. Length of the body 6 lines; of the wings 10 lines.

Subfam. Laphrites, *Walk.*

Gen. Laphria, *Fabr.*

11. Laphria tristis, *Dol.* See Vol. V. p. 146.

12. Laphria comes, *Walk.* See Vol. III. p. 85.

13. Laphria conveniens, *Walk.* See Vol. V. p. 278.

14. Laphria setipes, n. s. *Mas.* Cyanea, capite argenteo, antennarum articulo 3° lineari, thoracis lateribus anticis pectoreque albo tomentosis, abdomine purpureo longo, pedibus purpureis longissime setosis, femoribus posticis incrassatis, alis nigricantibus dimidio basali cinereo, halteribus albis.

Male. Blue; head silvery in front, thickly clothed beneath with white hairs; mystax with a few black bristles; third joint of the antennæ linear, conical at the tip; pectus and sides of the thorax in front with white tomentum; abdomen purple, slender, linear, about twice the length of the thorax; legs purple, thickly clothed to the tips of the tarsi with long black and white bristles; femora much incrassated, partly blue; wings blackish, cinereous for nearly half the length from the base; veins black; halteres white. Length of the body 8 lines; of the wings 12 lines.

15. Laphria flagellata, n. s. *Mas et Fœm.* Nigra, capite aurato, antennarum articulo 3° lato fusiformi, pectore albo tomentoso, segmentorum abdominalium marginibus posticis lateralibus albis, pedibus purpureo variis, alis nigris basi cinereis. *Mas.* Abdomine purpureo.

Male and Female. Blue; head brightly gilded in front, clothed beneath with white hairs; mystax with several black bristles; antennæ black, third joint broad, fusiform; pectus with white tomentum; abdomen with white tomentum on the hind borders of the segments; legs partly purple, thinly beset with black and white bristles; wings black, cinereous towards the base; veins and halteres black. *Male.* Abdomen purple. Length of the body 4½–5 lines; of the wings 8–9 lines.

Subfam. ASILITES, *Walk.*

Gen. TRUPANEA, *Macq.*

16. TRUPANEA GILOLONA, n. s. *Mas et Fœm.* Nigra, capite subtus albo piloso, fronte subaurata, mystace e setis nigris albisque, thorace cinereo vittis quatuor nigris, segmentorum abdominalium marginibus posticis ventreque cinereis, tibiis rufis apice nigris, alis cinereis strigis duabus subcostalibus sordide albidis, halteribus albidis.

Male. Black; head thickly clothed beneath with white hairs; front slightly gilded; epistoma prominent; mystax composed of many black and of fewer white bristles; third joint of the antennæ fusiform, about one-third of the length of the second; thorax cinereous, with four black stripes of the usual form; pectus hoary; abdomen slightly tapering from the base to the tip, about twice the length of the thorax; hind borders of the segments and underside cinereous; sexualia very small; legs stout with a few black bristles; tibiæ dark red, black towards the tips; wings dark cinereous; subcostal and radial areolets with dingy whitish stripes; veins black; halteres whitish. Length of the body 6 lines; of the wings 11 lines.

Female. Third joint of the antennæ fusiform, about one-fourth of the length of the arista; abdomen lanceolate, full twice the length of the thorax; apical part stylate, shining. Length of the body 9 lines; of the wings 12 lines.

Gen. ASILUS, *Linn.*

17. Asilus involutus, *Walk.* See Vol. V. p. 281.

18. ASILUS CONDECORUS, n. s. *Fœm.* Cyanescenti-niger, robustus, fronte aurata, mystace e setis plurimis nigris paucisque albis, thoracis suturis, lateribus, pectore et segmentorum abdominalium marginibus posticis canis, abdomine subplano non acuto, pedibus robustis, alis cinereis apices versus nigricantibus.

Female. Bluish black, stout, with black bristles; head gilded in front, thickly clothed beneath with white hairs; epistoma prominent; mystax composed of numerous black bristles and of a few white bristles; third joint of the antennæ elongate-conical, not more than one-fourth of the length of the style; pectus and sides, and sutures of the thorax with hoary tomentum; abdomen somewhat flat, slightly decreasing in breadth from the base to the tip, less than twice the length of the thorax; hind borders of the segments hoary; tip black, shining, not acute; legs stout, with slight white pubescence and with a few black bristles; wings cinereous, blackish towards the tips and along the adjoining part of the hind border; veins black; forks of the cubital vein undulating; halteres whitish. Length of the body 7 lines; of the wings 14 lines.

Gen. OMMATIUS, *Illiger.*

19. Ommatius noctifer, *Walk.* See Vol. III. p. 88.

20. Ommatius retrahens, *Walk.* See Vol. III. p. 88.

21. Ommatius platymelas, n. s. *Fœm.* Niger, latus, fronte aurata, thoracis lateribus subauratis, scutello cinereo, abdomine subplano, segmentorum marginibus posticis maculisque lateralibus trigonis cinereis, tibiis rufis apice nigris, alis nigris nigricante marginatis.

Female. Black, broad, stout; head clothed beneath with white hairs, gilded in front; epistoma flat; mystax extending to the base of the antennæ, composed of black bristles and of a few inferior white bristles; thorax slightly gilded on each side; scutellum cinereous; pectus hoary; hind borders of the segments and underside with cinereous tomentum, which forms triangular spots along each side; legs very robust, with black bristles; tibiæ red, with black tips; wings black, blackish towards the tips and along the hind border; halteres pale yellow. Length of the body 6 lines; of the wings 11 lines.

Fam. LEPTIDÆ, *Westw.*

Gen. Suragina, *Walk.*

22. Suragina signipennis, n. s. *Fœm.* Nigra, thorace vittis duabus lateribusque canis, abdomine cano lanceolato apicem versus compresso, femoribus apice fulvis, tibiis rufescenti-piceis, alis cinereis fasciis duabus maculaque interiore nigricantibus, gutta adhuc interiore nigra.

Female. Black; head with whitish tomentum behind and beneath; thorax with two hoary stripes, which are dilated and united hindward; sides and pectus also hoary; abdomen hoary, lanceolate, compressed towards the obtuse tip, nearly twice the length of the thorax; legs long, slender; femora with tawny tips; tibiæ reddish piceous; wings cinereous, with two blackish bands, which are united on the costa and are separated obliquely hindward, second band apical; a blackish elongated subcostal spot near the inner side of the first band, and a black discal dot still nearer the base; halteres yellowish towards the base. Length of the body 6 lines; of the wings 12 lines.

Fam. BOMBYLIDÆ, *Leach.*

Subfam. Therevites, *Walk.*

Gen. Thereva, *Latr.*

23. Thereva conscita, n. s. *Mas.* Nigra, argenteo tomentosa, thoracis disco nigro vittis duabus interlineatis canis, abdomine fasciis sex nigris, alis cinereis apices versus nigricante nebulosis.

Male. Black, with silvery hoary tomentum; head silvery white in front; 3rd joint of the antennæ lanceolate, nearly as long as the 1st and 2nd together; arista extremely short; disk of the thorax black,

with two hoary interlined stripes; abdomen silvery white, nearly linear, with a short fringe along each side, and with six black bands, 1st and 2nd bands broad, 3rd very broad, 4th and 5th very slender, 6th broad, apical; femora and tibiæ with silvery white tomentum; wings cinereous, slightly and partly clouded with blackish towards the tips; veins black; halteres white. Length of the body 6 lines; of the wings 10 lines.

Subfam. Bombylites, *Walk.*

Gen. Anthrax, *Fabr.*

24. Anthrax Pelops, *Walk.* See Vol. II. p. 90.

Fam. MUSCIDÆ, *Latr.*

Gen. Masicera, *Macq.*

25. Masicera morio, *Dol.* See Vol. V. p. 154.

Gen. Eurygaster, *Macq.*

26. Eurygaster ridibunda, *Walk.* See Vol. IV. p. 125.

Subfam. Dexides, *Walk.*

Gen. Rutilia, *Desv.*

27. Rutilia ixoides, *Walk.* See Vol. V. p. 289.

28. Rutilia fervens, var., *Walk.* See Vol. V. p. 288. *Mas.* Splendidissime cyaneo-viridis, capite plagis duabus anticis testaceis trigonis frontalibus, thoracis disco cupreo vittis quatuor nigris, abdomine vitta, fasciis tribus guttisque duabus apicalibus nigris, pedibus nigris, alis luridis.

Var. *Male.* Brilliant bluish green; head with a triangular testaceous patch on each side of the peristoma; frontalia deep black, widening much in front; antennæ black; arista pubescent; thorax with a cupreous disk and with four black stripes, of which the middle pair are much abbreviated hindward; abdomen with a black stripe and with three black bands, 1st band basal, 2nd and 3rd convex on each side in front, a black apical dot on each side; legs black; wings lurid; præbrachial vein forming a rounded, slightly obtuse angle at its flexure, very slightly curved inward from thence to its tip; discal transverse vein slightly undulating, parted by half its length from the border, and by more than half its length from the flexure of the præbrachial. Length of the body 7 lines; of the wings 16 lines.

29. Rutilia saturatissima, *Walk.* See Vol. V. p. 287.

30. Rutilia sapphirina, n. s. *Mas.* Obscure purpurascenti-cyanea,

capite argenteo, frontalibus atris, thorace non vittato, abdomine nigro fasciis tribus interruptis splendidissime purpurascenti-cyaneis, tibiis posticis fimbriatis, alis cinereis basi nigris.

Male. Dark purplish blue; head with silvery white tomentum; frontalia deep black, widening in front; antennæ black; arista hardly pubescent; thorax not striped; abdomen black, with three interrupted brilliant purplish-blue bands; 2nd band narrower than the 1st and than the 3rd, excavated on each side of the hind border, 3rd band apical, very broad; legs black; hind tibiæ fringed; wings cinereous, black at the base; præbrachial vein forming a rounded, obtuse angle at its flexure, hardly curved inward from thence to its tip; discal transverse vein hardly undulating, parted by little more than one-fourth of its length from the border, and by hardly more than half its length from the flexure of the præbrachial, which, like it, is very near the border. Length of the body 7 lines; of the wings 16 lines.

Gen. Gymnostylia, *Macq.*

31. Gymnostylia luteicornis, n. s. *Fœm.* Nigra, cinereo-tomentosa, frontalibus atris perangustis, palpis testaceis, antennis luteis, thorace vittis quatuor nigris, abdomine fulvo fusiformi macula basali trigona, pedibus fulvis longiusculis, alis cinereis apud venas fuscescente subnebulosis.

Female. Black, with cinereous tomentum; head with bristles along each side of the frontalia, which are deep black, linear and very narrow; palpi testaceous; antennæ luteous, 3rd joint short; arista bare, slender; thorax with four slender black stripes; pectus hoary; abdomen tawny, fusiform, a little longer and narrower than the thorax, with a black triangular spot at the base, and with black spines at the tip; legs tawny, rather long and slender; tibiæ darker than the femora; tarsi black; wings cinereous, very slightly brownish-clouded along the veins; veins black, tawny at the base, præbrachial vein forming a very obtuse angle at its flexure, almost straight from thence to its tip; discal transverse vein almost straight, parted by a little less than its length from the border, and by a little more than its length from the flexure of the præbrachial; alulæ white. Length of the body 4 lines; of the wings 7 lines.

Subfam. Sarcophagides, *Walk.*

Gen. Sarcophaga, *Meigen.*

32. Sarcophaga mendax, *Walk.* See Vol. IV. p. 132.

Subfam. Muscides, *Walk.*

Gen. Musca, *Linn.*

33. Musca costalis, *Walk.* See Vol. V. p. 159.

34. Musca promittens, *Walk.* See Vol. IV. p. 134.

35. Musca obtrusa, *Walk.* See Vol. III. p. 105.

Subfam. ANTHOMYIDES, *Walk.*

Gen. ATOMOGASTER, *Macq.*

36. ATOMOGASTER BISERIATA, n. s. *Fœm.* Cana, capite albo, frontalibus atris latiusculis, antennis nigris, thorace vittis tribus obscurioribus indistinctis, abdomine vitta nigricante maculisque sex quadratis nigris subtus testaceo, pedibus testaceis, alis cinereis.

Female. Hoary; head white; frontalia deep black, linear, rather broad; proboscis and palpi black, the latter slender, slightly curved; antennæ black, 3rd joint not reaching the epistoma; arista bare, stout at the base; thorax with three slender, indistinct, darker stripes; abdomen elongate-oval, testaceous beneath, with a blackish stripe, which is interrupted on the hind border of each segment, and with three quadrate black spots on each side; basal segment not spotted; legs testaceous; wings cinereous; veins black, testaceous towards the base; discal transverse vein straight, parted by about its length from the border, and by nearly twice its length from the præbrachial transverse; alulæ white. Length of the body $2\frac{3}{4}$ lines; of the wings $4\frac{1}{2}$ lines.

37. ATOMOGASTER TRISERIATA, n. s. *Fœm.* Schistacea, capite albo, frontalibus rufis, thorace vittis tribus obscurioribus indistinctis, abdomine maculis sex elongatis nigris, segmentis albo marginatis, femoribus apice tibiisque fulvis, alis cinereis.

Female. Slate-colour; head white; frontalia red, linear; thorax with three very indistinct darker stripes; abdomen fusiform, a little longer than the thorax, with three elongated black spots on each of the three last segments; hind borders of the segments white; legs black; tibiæ and tips of the femora tawny; wings cinereous; veins black, tawny at the base; discal transverse vein hardly bent inward, parted by hardly less than its length from the border, and by nearly twice its length from the præbrachial transverse; alulæ white. Length of the body $2\frac{1}{2}$ lines; of the wings 4 lines.

Subfam. HELOMYZIDES, *Fallén.*

Gen. HELOMYZA, *Fallén.*

38. HELOMYZA INTERVENTA, n. s. *Fœm.* Testacea, crassa, capite, scutelli apice, abdomine femoribusque nigris, alis cinereis antice subluridis.

Female. Testaceous, thick; head black, bristly above, white in front; antennæ testaceous, 3rd joint short; arista plumose; scutellum black towards the tip; abdomen black, elliptical, not longer than the thorax; femora black; wings cinereous, with a lurid tinge in front;

veins black, testaceous at the base; discal transverse vein straight, parted by a little more than half its length from the border, and by full twice its length from the præbrachial transverse. Length of the body 3 lines; of the wings 5 lines.

Gen. Dryomyza.

39. Dryomyza semicyanea, *Walk.* See Vol. III. p. 109.

Gen. Sciomyza, *Fallén.*

40. Sciomyza? leucomelana, *Walk.* See Vol. IV. p. 144.

Subfam. Lauxanides, *Walk.*

Gen. Lonchæa, *Fallén.*

41. Lonchæa? consentanea, *Walk.* See Vol. IV. p. 146.

Subfam. Ortalides, *Haliday.*

Gen. Lamprogaster, *Macq.*

42. Lamprogaster superna, n. s. *Fœm.* Testacea, capite supra nigro, oculis albo-marginatis, thoracis disco cyaneo, abdomine supra purpureo, alis cinereis basi et apud costam fulvis, striga transversa guttaque antica exteriore nigris, striga costali apicali nigricante.

Female. Testaceous, shining; head black above, white about the eyes; mouth large; antennæ short, 3rd joint not more than half the length of the face; arista bare, pubescent at the base; scutellum and disk of the scutum blue; abdomen oval, purple above, a little shorter and broader than the thorax; wings cinereous, tawny at the base and along the costa, a black streak extending from the costa along the præbrachial transverse to the præbrachial vein; a black exterior dot on the radial vein, and a blackish streak at the tip of the costa; veins black, testaceous towards the base; discal transverse vein straight, oblique, parted by hardly one-third of its length from the border, and by about its length from the præbrachial transverse. Length of the body 5 lines; of the wings 10 lines.

Gen. Platystoma, *Latr.*

43. Platystoma potens, n. s. *Mas et Fœm.* Cinerea, crassa, capite ochraceo, thorace vittis septem nigris, abdomine subtus testaceo, pedibus rufescentibus, tarsis nigris basi testaceis, tibiis anticis apice nigris, alis cinereis nigricante confertissime guttatis, halteribus testaceis.

Male and Female. Cinereous, broad, thick; head ochraceous, white about the eyes and behind; face with a slender piceous stripe; antennæ ochraceous; 3rd joint long, linear, about half the length of the

face; arista whitish, bare, ochraceous at the base; thorax with seven slender blackish stripes; scutellum large, prominent; abdomen conical, testaceous beneath, much shorter than the thorax; oviduct long, black, slender, stylate; legs dull reddish; tarsi black, testaceous at the base; fore tibiæ with black tips; wings cinereous, with very numerous various-shaped blackish spots and dots which form irregular bands; veins black, tawny along the costa, where there is a short lurid streak in the middle; discal transverse vein straight, parted by less than half its length from the border, and by much more than its length from the very oblique præbrachial transverse vein; halteres testaceous. Length of the body 6 lines; of the wings 12 lines.

This species is closely allied to *P. producta*, but the subapical cinereous band contains two dots.

44. Platystoma pectoralis, n. s. *Mas.* Cinerea, capite ochraceo, facie nigro biguttata, thorace vittis quinque nigricantibus, pectore vittis sex luteis, femoribus apice luteis, tibiis luteis apice nigris, tarsis basi pallide flavis, alis cinereis nigricante confertissime guttatis, halteribus pallide flavis.

Male. Cinereous; head ochraceous, white along the eyes; a black dot on each side of the face; antennæ about half the length of the face; arista black; thorax with five blackish stripes; pectus with three luteous stripes on each side; abdomen conical, shorter than the thorax; femora with luteous tips; tibiæ luteous, with black tips; tarsi pale yellow at the base; wings cinereous, with very numerous various-sized, partly confluent, blackish dots; veins black; discal transverse vein curved outward, parted by much less than half its length from the border, and by more than its length from the oblique præbrachial transverse vein; halteres pale yellow. Length of the body $4\frac{1}{2}$ lines; of the wings 9 lines.

Gen. Dacus, *Fabr.*

45. Dacus strigifer, n. s. Cyaneo-niger, facie rufescente strigata, oculis argenteo marginatis, palpis apice rufescentibus, antennis longis basi rufescentibus, arista alba pubescente, thorace vittis tribus cinereis, tarsis posterioribus femoribusque albis apice nigris, alis cinereis, costa striga basali fasciaque lata exteriore nigris.

Bluish black; head silvery, hoary behind and about the eyes; face triangular, with a reddish streak which is abbreviated towards the peristoma; palpi with reddish tips; antennæ black, reddish towards the base; 3rd joint slender, very long, extending to the peristoma; arista white, pubescent, bare towards the tip, much longer than the 3rd joint; thorax with three cinereous stripes, which are united hindward; pectus cinereous; abdomen wanting; legs black; femora white, black towards the tips; fore coxæ white; posterior tarsi white, with black tips; wings limpid, black along the costa; a black discal

streak extending from the base to one-third of the length; a black broad irregular oblique band beyond the middle; veins black; discal transverse vein straight, parted by less than half its length from the border, and by about its length from the very oblique præbrachial transverse vein, which equals it in length; halteres white. Length of the body 6 lines; of the wings 10 lines.

46. Dacus furcifer, n. s. *Mas.* Anthracina, cinereo-tomentosa, antennis vix longis, arista plumosa, thorace vittis tribus nigricantibus, pedibus longiusculis, alis cinereis nigro bifasciatis, fascia 2ª latissima, linea costali exteriore apicem versus furcata, halteribus albis.

Male. Coal-black, with cinereous tomentum; third joint of the antennæ slightly tapering from the base to the tip, much shorter than the face; arista plumose; thorax with three blackish stripes; abdomen linear, narrower and very much longer than the thorax; legs rather long; wings cinereous; apical part of the costa with a black line, which emits a fork towards the tip; a narrow black oblique band before the middle, and beyond the middle a very broad black band, which is oblique in the contrary direction; veins black; discal transverse vein very slightly curved outward, parted by about one-fourth of its length from the border, and by less than its length from the straight, upright præbrachial vein, which is not more than half its length; halteres white. Length of the body 5 lines; of the wings 10 lines.

47. Dacus expertus, n. s. *Fœm.* Cyaneus, palpis, antennis pedibusque nigris, thorace vittis tribus cinereis, pedibus breviusculis, alis cinereis, costa exteriore apicibusque nigris, venis transversis nigro marginatis, halteribus testaceis.

Female. Dark blue; palpi, antennæ, and legs black; 3rd joint of the antennæ linear, slender, extending to the peristoma; thorax with three cinereous stripes; pectus cinereous; abdomen elongate-conical, a little longer and narrower than the thorax; legs short, stout; wings cinereous, black along the exterior part of the costa and about the tips; transverse veins clouded with black; discal transverse vein almost straight, parted by about half its length from the border and by about its length from the præbrachial transverse vein, which is oblique; halteres testaceous. Length of the body 4 lines; of the wings 8 lines.

48. Dacus perplexus, n. s. *Fœm.* Niger, capite luteo, facie nigro biguttata, antennis luteis longis, arista nigra nuda, thorace vittis tribus luteis, pectore maculis duabus trigonis luteis, abdomine fulvo lato striga brevi nigricante, pedibus luteis, alis limpidis, striga basali, vitta costali dentata vittaque postica angulata fuscis.

Female. Black; head pale luteous, with a piceous dot on the front, and with a round black dot on each side of the face; 3rd joint of the antennæ extending to the peristoma, very slightly tapering from the base to the tip; arista black, bare; thorax with a luteous stripe, with

two luteous humeral calli, and with two hindward lateral luteous streaks; pectus with a large luteous triangular spot on each side; abdomen tawny, elliptical, with a slight blackish stripe, which is much abbreviated in front, longer and much broader than the thorax; oviduct long, slender, lanceolate; legs luteous; wings limpid, with a brown costal stripe which emits an angle in the middle, the angle parallel to an angular brown stripe on the hind border; an oblique brown streak proceeding from the base, and a brownish dot near the tip hindward; veins black, tawny towards the base; discal transverse vein undulating, parted by a little more than one-fourth of its length from the border, and by a little more than its length from the straight, upright præbrachial transverse vein; halteres pale yellow. Length of the body 6 lines; of the wings 12 lines.

Gen. Sophira, *Walk.*

49. Sophira punctifera, n. s. *Fœm.* Testacea, antennarum articulo 3° brevi oblique truncato, arista nuda, thoracis abdominisque lateribus nigro punctatis, pedibus breviusculis, alis nigricantibus latiusculis albido conferte punctatis.

Female. Testaceous; antennæ not nearly reaching the epistoma; 3rd joint short, obliquely truncated at the tip; arista bare; thorax, pectus, and abdomen with black points along each side; abdomen conical, not longer than the thorax; oviduct short, lanceolate; legs rather short and slender; wings blackish, rather broad, adorned with numerous transverse whitish points; discal transverse vein nearly straight, parted by one-fourth of its length from the border, and by about its length from the straight, upright præbrachial transverse vein. Length of the body 3 lines; of the wings 6 lines.

Gen. Ortalis, *Fallén.*

50. Ortalis punctifascia, n. s. *Fœm.* Cyanea, capite nigro, oculis albo marginatis, antennis rufis, arista plumosa, pedibus nigris, tarsis albis, alis albis nigro quadrifasciatis, fascia 3ª punctum album includente, 4ª strigam costalem emittente.

Female. Dark blue, shining; head black, white about the eyes; antennæ dark red, very short; 3rd joint conical, not much longer than the 2nd; arista plumose; abdomen very little longer than the thorax; oviduct black, furrowed; legs black; tarsi white, with black tips; wings white, with four black bands; 1st band basal; 3rd much broader than the others, including a white costal point; 4th emitting a black costal streak to the tip of the wing; præbrachial vein forming an angle at its junction with the discal transverse vein; the latter straight, parted by half its length from the border, and by much more than its length from the præbrachial transverse vein; halteres black. Length of the body $2\frac{1}{2}$ lines; of the wings $4\frac{1}{2}$ lines.

51. Ortalis æquifera, n. s. *Mas et Fœm.* Cyanescenti-nigra,

capite antico rufo, oculis albo marginatis, antennis rufis, arista nuda, thorace vitta lata cinerea, abdomine basi fulvo, coxis femoribusque anticis fulvis, alis cinereis vitta fasciisque duabus exterioribus nigris.

Male and Female. Bluish black; head black, red in front, white about the eyes; antennæ red, not reaching the epistoma; 3rd joint rather long, slightly tapering to the tip; arista bare; thorax with a broad cinereous stripe; pectus cinereous; abdomen linear, black, tawny towards the base, broadest in the female and with a prominent oviduct; legs black; fore coxæ and fore femora tawny; wings cinereous, with a black stripe extending from the base along the costa and thence descending to the middle of the disk; two exterior black bands, which are united on the costa, the second apical; discal transverse vein straight, parted by one-third of its length from the border, and by more than its length from the præbrachial transverse. Length of the body $2\frac{1}{2}$ lines; of the wings $4\frac{1}{2}$ lines.

52. Ortalis concisivitta, n. s. *Mas.* Rufa, oculis albo marginatis, scutello, metathorace, pectoris disco abdominisque apice cyaneis, alis nigricantibus, margine postico fascia apicibusque cinereis.

Male. Red, shining; head white about the eyes; antennæ nearly reaching the epistoma; 3rd joint long, linear; arista simple; scutellum, metathorax, disk of the pectus and abdomen towards the tip blue; abdomen conical, not longer than the thorax; wings blackish, cinereous along the hind border and towards the tips, which are blackish; a cinereous band between the transverse veins; veins black; discal transverse vein straight, upright, parted by less than one-fourth of its length from the border, and by hardly more than its length from the præbrachial transverse. Length of the body $2\frac{1}{4}$ lines; of the wings $4\frac{1}{2}$ lines.

Gen. Trypeta, *Meigen.*

53. Trypeta retorta, n. s. *Fœm.* Picea, subtus testacea, capite, scutello abdominisque basi testaceis, pectoris disco piceo, femoribus anticis tibiis tarsisque testaceis, alis limpidis nigricante angulatim bivittatis.

Female. Piceous setose, testaceous beneath; head and antennæ testaceous, the latter not reaching the epistoma, 3rd joint linear; arista plumose; scutellum testaceous; disk of the pectus piceous; abdomen ovate, testaceous towards the base, a little longer than the thorax; terebra flat, conical; tibiæ, tarsi and fore femora testaceous; wings limpid, with a blackish costal stripe, which is broadest at the base and concave towards the tip, and is nearly parallel to another blackish stripe; the latter is also broadest at the base, and forms a right angle opposite the concavity of the fore stripe; discal transverse vein oblique, nearly straight, parted by one-third of its length from the border, and by a little less than its length from the præbrachial transverse. Length of the body 4 lines; of the wings 8 lines.

Subfam. Sepsides, *Walk.*

Gen. Calobata, *Fabr.*

54. Calobata impingens, *Walk.* See Vol. IV. p. 161.

55. Calobata gutticollis, n. s. *Fœm.* Nigra, capite guttis duabus nigris, thorace antico guttis duabus lateralibus nigris, femoribus anticis apice tibiisque anticis nigris, tarsis anticis albis, femoribus posterioribus piceo fasciatis, alis fuscescentibus cinereo trimaculatis.

Female. Testaceous; vertex with a black dot; disk of the front black; thorax with a black dot on each side in front; fore femora towards the tips and fore tibiæ black; fore tarsi white; posterior femora with a piceous band near the tips, which are also piceous; wings brownish, with three rather indistinct pale cinereous dots, of which the two exterior form an interrupted band; veins with the usual structure. Length of the body 5–5½ lines; of the wings 8–9 lines.

56. Calobata diffundens, n. s. *Fœm.* Subcinereo-nigra, capite chalybeo, oculis albo-marginatis, palpis antennis abdominisque apice rufescentibus, pedibus luteis, femoribus anticis dimidio apicali tibiisque anticis nigris, tarsis anticis albis basi nigris, femoribus posterioribus subdilatatis nigro trifasciatis, tibiis tarsisque posticis nigris, alis cinereis nigricante bifasciatis.

Female. Black; head chalybeous, white about the eyes; mouth and palpi reddish; thorax and abdomen with slight cinereous tomentum; abdomen lanceolate, nearly twice the length of the thorax, with a reddish tip; legs luteous; fore femora for half the length from the tips and fore tibiæ black; fore tarsi white, black at the base; posterior femora slightly dilated, with three black bands; hind tibiæ and hind tarsi black; wings cinereous, with two blackish bands, the 2nd apical; veins black, with the usual structure; halteres white. Length of the body 5 lines; of the wings 8 lines.

Subfam. Psilides, *Walk.*

Gen. Angitula, *Walk.*

57. Angitula longicollis, *Walk.* See Vol. III. p. 123.

Gen. Nerius, *Wied.*

58. Nerius duplicatus, *Wied.* See Vol. III. p. 125.

Fam. HIPPOBOSCIDÆ, *Leach.*

Gen. Ornithomyia, *Leach.*

59. Ornithomyia Batchianica, *Walk.* See Vol. V. p. 300.

Ternate.

Fam. STRATIOMIDÆ, *Haliday.*

Gen. Ptilocera, *Wied.*

1. Ptilocera 4-dentata, *Fabr.* See Vol. I. p. 7.

Fam. ASILIDÆ, *Leach.*

Subfam. LAPHRITES, *Walk.*

Gen. LAPHRIA, *Fabr.*

2. Laphria socia, *Walk.* See Vol. III. p. 84.

Subfam. ASILITES, *Walk.*

Gen. ASILUS, *Linn.*

3. Asilus condecorus, *Walk.* See p. 7.

Male? Abdomen with a brownish tinge; sexualia very large.

4. ASILUS NORMALIS, n. s. *Mas et Fœm.* Cinereo-niger, capite subaurato, mystace e setis albis nigrisque, thorace vittis tribus anticis cinereis, abdomine fasciis fulvis, femoribus apices versus tibiisque rufescentibus, his nigro strigatis, alis nigris basi cinereis, halteribus sordide testaceis. *Fœm.* Abdomine stylato.

Male and *Female.* Cinereous black; head slightly gilded, with hoary hairs beneath; mystax with many white bristles and with a few higher black bristles; pectus and three stripes on the fore part of the thorax cinereous; abdomen with bands of tawny hairs and tomentum; legs stout; femora towards the tips and tibiæ reddish, the latter streaked with black; wings black, cinereous towards the base, the cinereous part extending in the disk beyond the middle; veins black, reddish at the base; lower branch of the cubital vein undulating; halteres dingy testaceous. *Male.* Abdomen lanceolate; sexualia small, elongate. *Female.* Abdomen elongate-conical, with narrower bands than those of the male; the four apical segments forming a black, shining, slender style. Length of the body 7–8 lines; of the wings 12 lines.

Gen. OMMATIUS, *Illiger.*

5. Ommatius retrahens, *Walk.* See Vol. IV. p. 88.

Gen. LEPTOGASTER, *Meigen.*

6. LEPTOGASTER EXACTA, n. s. *Mas.* Picea, capite pectoreque canis, antennis nigris basi luteis, thorace obscure rufo vittis tribus nigricantibus, pedibus pallide luteis, femoribus nigro bifasciatis, tibiis posticis apice tarsisque nigris, alis subcinereis apice nigro marginatis, halteribus pallide flavescentibus.

Male. Piceous; head hoary behind and beneath; antennæ black, luteous at the base; thorax dark red, with three blackish stripes; sides and pectus hoary; abdomen very slender; legs pale luteous; femora with two black bands, which are most distinct on the hind pair; tarsi and hind tibiæ towards the tips and knees black; wings slightly cinereous, black-bordered at the tips; veins black; halteres pale yellowish. Length of the body 6 lines; of the wings 10 lines.

Fam. SYRPHIDÆ, *Leach.*

Gen. SYRPHUS, *Fabr.*

7. Syrphus ericetorum, *Fabr.* See Vol. III. p. 97.

Fam. MUSCIDÆ, *Latr.*

Subfam. TACHINIDES, *Walk.*

Gen. EURYGASTER, *Macq.*

8. Eurygaster remittens, *Walk.* See Vol. IV. p. 125.

Subfam. DEXIDES, *Walk.*

Gen. DEXIA, *Meigen.*

9. DEXIA PARALLELA, n. s. *Mas.* Nigra, angusta, cylindrica, palpis antennisque rufis, his apice piceis, arista plumosa, thorace vittis tribus albidis, abdomine chalybeo-nigro fasciis albidis atrisque, pedibus longis, alis vitreis vitta costali nigra.

Male. Black, long, slender, cylindrical; head white, with a black band on each side between the eye and the epistoma; front prominent; frontalia broad, deep black; face slightly oblique; antennæ and palpi red; the former piceous towards the tips, nearly reaching the epistoma; 3rd joint linear, slender, rounded at the tip, about four times the length of the 2nd; arista plumose; thorax with three whitish stripes, the lateral pair broad, interrupted; pectus and postscutellum whitish, the former with two black bands on each side; abdomen chalybeous black, full twice the length of the thorax; segments with whitish fore borders and deep-black hind borders; legs long, slender; wings vitreous, with a black costal stripe, which is interlined with cinereous; veins pale except along the costa; præbrachial vein forming a slightly obtuse angle at its flexure, slightly curved inward from thence to its tip; discal transverse vein slightly undulating, parted by half its length from the border, and by a little less than its length from the flexure of the præbrachial; alulæ large, white. Length of the body 6 lines; of the wings 10 lines.

Gen. RUTILIA, *Desv.*

10. Rutilia atribasis, *Walk.* See Vol. V. p. 288.

11. RUTILIA EXCELSA, n. s. *Mas.* Cyaneo-viridis, capite albo strigis duabus lateralibus anticis nigris, frontalibus atris, abdomine cupreo, basi vitta et segmentorum marginibus posticis nigris, pedibus nigris, alis fuscescenti-cinereis basi fusco notatis.

Male. Bluish green; head white, with a black streak on each side, extending from the borders of the eyes to the epistoma; frontalia deep black, very narrow on the vertex, widening much in front; thorax

tinged here and there with cupreous; abdomen cupreous, with the 1st segment and a slender stripe deep black; the following segments, which are black along their hind borders, bluish green; legs black; wings brownish cinereous, tinged with brown near the base; præbrachial vein forming a rounded right angle at its flexure, very slightly curved inward from thence to its tip; discal transverse vein slightly undulating, parted by less than one-third of its length from the border, and by very much more than its length from the flexure of the præbrachial. Length of the body $7\frac{1}{2}$ lines; of the wings 17 lines.

Subfam. Muscides, *Walk.*

Gen. Musca, *Linn.*

12. Musca promittens, *Walk.* See Vol. IV. p. 134.

Subfam. Ortalides, *Haliday.*

Gen. Platystoma, *Latr.*

13. Platystoma potens, *Walk.* See p. 12.

Ceram.

Fam. STRATIOMIDÆ, *Haliday.*

Gen. Ptilocera, *Wied.*

1. Ptilocera 4-dentata, *Fabr.* See Vol. I. p. 7.

Gen. Clitellaria, *Meigen.*

2. Clitellaria obesa, *Walk.* See Vol. V. p. 232.

Fam. TABANIDÆ, *Leach.*

Gen. Tabanus, *Latr.*

3. Tabanus serus, n. s. *Fœm.* Cinereus, capite subtus pectoreque albis, antennis fulvis apice nigris, thorace vittis duabus ferrugineis, callis humeralibus testaceis, abdomine pedibusque fulvis, alis cinereis apud costam fuscis.

Female. Black, with cinereous tomentum; head beneath and pectus white; callus black, very slender, broader in front; palpi cinereous; antennæ tawny with cinereous tomentum towards the base, 3rd joint slightly curved, black towards the tip, with a very small horn; thorax with two ferruginous tomentose stripes; humeral calli testaceous; abdomen tawny, elongate-conical; legs tawny; tarsi black; wings cinereous, brown along the costa; veins black, with the usual structure, tawny at the base; halteres pale. Length of the body 6 lines; of the wings 12 lines.

Fam. ASILIDÆ, *Leach.*

Subfam. Laphrites, *Walk.*

Gen. Laphria, *Fabr.*

4. Laphria tristis, *Dol.* See Vol. V. p. 146.
5. Laphria Vulcanus, *Wied.* See Vol. I. p. 10.
6. Laphria ostensa, n. s. *Mas.* Nigra, aureo-pilosa, capite aurato, mystace nigro, thorace strigis quatuor lateralibus obliquis cinereis, abdomine subaurato segmentorum marginibus subauratis apice nigro alis limpidis dimidio apicali nigro.

Male. Black, wholly clothed with gilded hairs; head brightly gilded in front; mystax composed of some black bristles; third joint of the antennæ elongate-fusiform; thorax with two cinereous oblique streaks on each side; abdomen with cinereous tomentum; sides and hind borders of the segments slightly gilded; tip black, shining; legs thickly clothed with long gilded hairs; wings limpid; apical half black; halteres pale yellowish. Length of the body 8 lines; of the wings 14 lines.

Subfam. Asilites, *Walk.*

Gen. Ommatius, *Illiger.*

7. Ommatius inextricatus, n. s. *Mas.* Subaurato-cinereus, capite aurato, mystace e pilis aureis, antennis nigris basi fulvis, thorace lineis cinereis, segmentorum abdominalium marginibus posticis flavescenti-auratis, sexualibus rufis, pedibus nigris robustis, tibiis fulvis, alis lurido-cinereis.

Male. Black, with cinereous slightly gilded tomentum; head gilded, with white hairs beneath; mystax with gilded bristles; antennæ black, tawny towards the base, 3rd joint elongate-conical; thorax with slender cinereous stripes; abdomen with a yellowish gilded band on the hind border of each segment; sexualia deep red, shining; legs very stout; tibiæ tawny; wings lurid-cinereous, darker cinereous hindward and towards the tips; veins red; halteres dull reddish. Length of the body 9 lines; of the wings 16 lines.

Gen. Leptogaster, *Meigen.*

8. Leptogaster magnicollis, n. s. *Mas.* Fulva, capite nigro antice argenteo, mystace albo, antennis fulvis basi apiceque nigris, thorace maculis duabus nigricantibus, abdomine tenui clavato apicem versus nigro, alis sublimpidis costa apiceque cinereis.

Male. Bright tawny; head black above, silvery white in front; mystax with white bristles; antennæ tawny, black towards the base and at the tips; thorax with a blackish spot on each side in front; pectus with pale gilded tomentum; abdomen slender, clavate, full thrice the length of the thorax, black towards the tip; tarsi much darker than

the tibiæ; wings nearly limpid, cinereous along the costa and towards the tips; veins black, tawny towards the base; halteres with piceous knobs. Length of the body 8 lines; of the wings 12 lines.

Fam. SYRPHIDÆ, *Leach.*

Gen. ERISTALIS, *Latr.*

9. Eristalis splendens, *Leg.* See Vol. III. p. 95.

Fam. MUSCIDÆ, *Latr.*

Subfam. SARCOPHAGIDES, *Walk.*

Gen. SARCOPHAGA, *Meigen.*

10. Sarcophaga sericeo-nitens, *Dol.* See Vol. V. p. 158.

Subfam. MUSCIDES, *Walk.*

Gen. MUSCA, *Linn.*

11. Musca costalis, *Dol.* See Vol. V. p. 159.

Subfam. ORTALIDES, *Haliday.*

Gen. OXYCEPHALA, *Macq.*

12. OXYCEPHALA ALIENATA, n. s. *Mas.* Rufescenti-fulva, capite nigro biguttato, metathorace pectoreque nigris, abdomine fusiformi basi supra nigro, femoribus basi nigro notatis, alis fuscis dimidio postico cinereo.

Male. Reddish tawny; head with a black dot in front of the base of the antennæ; face with two grooves; antennæ almost reaching the epistoma; 2nd joint clavate; 3rd linear, rounded at the tip, broader but not longer than the 2nd; metathorax and pectus black; abdomen fusiform, longer than the thorax, black above towards the base; legs robust; femora marked with black at the base; wings brown, hinder half cinereous; veins tawny, discal transverse vein slightly undulating, parted by hardly half its length from the border and by much more than its length from the præbrachial transverse. Length of the body 7 lines; of the wings 16 lines.

Gen. DACUS, *Fabr.*

13. DACUS ABSOLUTUS, n. s. *Fœm.* Cinereus, capite fulvo, facie nigro biguttata, antennis longis arista nuda, thoracis lateribus scutelloque fulvis, abdomine fasciis interruptis nigris, apice plano stylato-lanceolato, alis cinereis costa fuscescente.

Female. Black, with hoary tomentum; head tawny; face oblique, with a black dot in the groove on each side; antennæ quite reaching the epistoma; 3rd joint very long, conical at the tip; arista bare; sides of the thorax, humeral calli and scutellum tawny; abdomen tawny, oval, with the exception of the four apical segments, which are shining and form a flat lanceolate style; basal part with four interrupted black

bands; legs testaceous; wings cinereous; with a brownish tinge along the costa; discal transverse vein straight, parted by one fourth of its length from the border and by about its length from the oblique præbrachial transverse vein; halteres testaceous. Length of the body 6 lines; of the wings 9 lines.

Gen. Sophira, *Walk.*

14. Sophira bipars, n. s. *Fœm.* Fulva, nitens, abdomine nigro basi fulvo, alis nigris margine postico cinereo limpido-interlineato.

Female. Tawny, shining, with a few black bristles; head and pectus paler; 3rd joint of the antennæ linear, rounded at the tip, not reaching the epistoma; arista simple; abdomen oval, black except towards the base, shorter than the thorax; wings black, with a cinereous partly limpid stripe on the hind border; this stripe is interrupted by a black streak which extends along the discal transverse line; a pale point on the middle of the costa; discal transverse vein straight, parted by half its length from the border, and by about its length from the præbrachial transverse, which is rather long. Length of the body 2½ lines; of the wings 7 lines.

On the Possibility of taking a Zoological Census.

By Alfred Newton, M.A., F.L.S.

[Read March 21, 1861.]

It is now nearly five years since my friend, the late Mr. John Wolley, to whose genius as a naturalist I am proud to own my many great obligations, suggested to me in a letter the possibility of taking a census of the birds of these islands. The period of numbering the human population of the British Empire, which is now so close at hand, makes me think the present time, when men's minds are turned to the subject, not inopportune to bring to the notice of this Society the advantages which might possibly accrue to Zoology by taking an approximate census, not only of our birds, but also of the other divisions of our fauna. I believe that naturalists will bear me out in the assertion that hitherto nothing of this kind has ever been attempted in any branch of the science, and also that (with perhaps very few, but highly laudable, exceptions) no writer has ventured to express in any convenient form the relative proportion which the number of individuals of one species bears to those of another. In almost all local faunas the abundance or scarcity of different species is expressed in very arbitrary, not to say vague, terms. We find nothing more definite than the words "common," "frequently met with," "rare" or "occasionally seen" appended to the names of animals in some

even of the most carefully drawn-up lists. And yet, setting aside the immense difference there may exist between personal powers and opportunities of observation, to what two men will these phrases convey exactly the same meaning? Now I confess I know not in what way such records can be reduced, so to speak, to a common standard, save by expressing them in figures; nor how they can become generally useful unless they are understood in one and the same sense. It is far from my wish to depreciate such observations, and I say this to guard against misapprehension. Nay, I say more, if they are not taken for more than they are worth, they are highly useful; but *only as a basis for future and more complete inquiries*. In their present state, as it seems to me, there is no denying that they are imperfect. To take, for instance, an example from that branch of Zoology of which I am least ignorant. A Devonshire and a Durham ornithologist in a local list of birds would probably each return *Phyllopneuste trochilus* and *P. rufa* as "common." But were they to change places, the previous experience of each would, in a very short time, convince them that whereas, in the southern county, the latter species may double the former in numbers, in the northern the proportion might be exactly reversed. Now there are not very many people who have the chance of personally comparing for any sufficient time the proportionate numbers of the summer warblers on the banks of the Tamar and of the Tees. Besides, too, there is perhaps the naturalist resident perforce in Derbyshire who would fain institute a comparison between his own observations and those taken in Devonshire and Durham. The case becomes still more hopeless when we turn to foreign countries, and, referring to the duchy of Darmstadt or the province of Dauphiny, attempt to ascertain the relative abundance therein of the species I have named.

Having thus briefly indicated the existing want of any such standard whereby local observations may be compared, I turn to the advantages which seem likely to follow the practical rendering of this suggestion. As chief among them (and the only one I will here adduce) I would place the light which might in consequence be thrown upon what we have lately heard so much of, the great question of the "struggle for life." It appears to me that before we can assign any cause for the predominance of any one species over another in any given district, the first thing to be ascertained is *the measure of that predominance*. This found, if the relative abundance of other species which influence its well-being—say, of insects or plants as affording it food and harbour,

or of predatory animals as checking its increase—we shall surely have acquired some valuable facts bearing upon its existence, and thus be enabled to judge with less chance of error respecting its preservation as a "favoured race." I am well aware that, in urging these remarks, I am laying myself open to the charge of Utopianism—and justly so, were I for a moment to deceive myself or to attempt to deceive others with the hope that such observations as I am advocating could be satisfactorily made, *except in very few instances*. But with these very few instances I am prepared to be content, at all events as a first step; for, if I mistake not, they would speedily be found of service, and the desire to extend them would as speedily grow.

Now as to the method by which these suggestions may be put in practice. It is plain that here lies the chief difficulty, and I only approach it with great caution. It may be at first sight not unnaturally objected, that the difference between personal powers of observation, which I have before mentioned, and the existence of which no one can doubt, will be as insuperable when these observations are represented in numbers as when they are expressed in words. I trust, however, that the Society will give me credit for asserting, on the strength of a somewhat protracted trial, that this objection is unfounded. I do not desire at present to go into particulars. I will merely state that I have found that, with comparatively little trouble, a sufficiently accurate account of the appearance, not only of every species of bird, but, with respect to many species, of every individual bird may be kept; and I do not see any reason why the same principle should not be extended to other groups of the animal kingdom. Indeed, I think that zoologists have only to apply themselves to the task, each in his own district, to accomplish what is wanted. So far the matter is easy; and were it only required that the numbers seen should be polled, no particular obstacle presents itself. But the real hindrance I find in what I may perhaps be allowed to call the "disturbing forces," which must be duly appreciated before the returns from different localities can be reduced to a common standard for comparison. Herein the zoologist must avail himself of the help of the geologist and the botanist; and therefore have I thought it expedient to introduce the subject of this paper to the Linnean Society, a body so fully competent to deal with the mixed questions which must arise from its consideration, and with which I freely acknowledge my utter inability to cope. But I may also add that it is my intention immediately to pursue the matter further as regards

the branch of natural history to which I am most addicted, and, through a channel whereby I can address myself especially to my brother ornithologists *, to enter into details which I should not be warranted in inflicting upon this Society, from some of whose members, however, I trust to receive that support in investigating the generalities of the case which can alone secure to the project even the smallest degree of success.

On certain Appendages to the Feet of Insects subservient to Holding or Climbing. By Tuffen West, F.L.S.

[Abstract of papers read March 21 and June 6, 1861.]

The structures in the foot of the Fly having long occupied the author's attention, he was induced, by the fact of their minuteness and the difficulties attending satisfactory examination and reasoning thereon, to search amongst insects generally for examples of analogous structures on a larger scale. With this view many examinations were made of such insects as could be procured; and whenever practicable, they were viewed in action in the live-box. The importance of this was urged as the only way to obtain correct ideas regarding structures which must be more or less soft in order to fulfil their intended purposes, and which, therefore, are generally found shrivelled and distorted in dried specimens.

The labours of other observers in the same field were first mentioned, from which it appears that the way in which some insects are enabled to suspend themselves or to walk freely against gravity had been ascribed to causes which might conveniently be classified as follows:—

A. By the entire cushions (of flies) acting as suckers.

B. By the hairs with which the under surface of these cushions is furnished acting

a. as minute hooks;

b. as suckers;

c. by adhesion through the emission of a *viscid* secretion from supposed glands in their expanded terminations;

d. as suckers, adhesion being assisted by the emission of a small quantity of fluid from such supposed glands.

The author then gave the results of his own examinations, stating that similar structures to those on the feet of flies were present in many beetles, the largest being on the dilated anterior tarsi of the males amongst the Geodephagi or ground-beetles.

* See 'The Ibis' for 1861, pp. 190–196.

Those presented by *Pterostichus* were then somewhat minutely described, as the largest the author had had the opportunity of observing whilst living and in action. They may be considered as composed of two portions: the first is an elastic membrane, perfectly smooth on the lower surface to admit of its exact adaptation; the second, on which the former is borne, is a long stem or pedicle arising at an oblique angle from the tarsal joint, and bent suddenly downwards near its insertion into the membranous portion, by which the latter is rendered capable of being brought into contact through its whole extent with the surfaces to which it is applied. In the beetle in question the membrane is reniform, with its long axis directed transversely. *Amara* was then noticed as possessing similar organs, with some of the *Carabi*; it appeared that, as a *general* rule, their number was increased as their size diminished. The presence of scale-like hairs on the back of these membranous expansions in some cases was mentioned as affording a clue to the condition in *Carabus*, where irregular elevated wrinkles simulate such corrugations as would be produced by the contraction of a membranous tube.

The structure of these expanded membranous organs was shown to agree in every respect with that of true hairs—as being hollow for some distance, seated in a depression of the integument on a slight papilla, and shut off from the cavity of the joint by a delicate membrane, to which some fibres (including probably a nerve) could be traced. These statements were borne out by examinations of the parts in *Carabus* and *Dyticus*, whence the scarcely expected result was obtained that the "suckers" of the latter are themselves only hairs still more modified.

Various forms of these spathulate hairs, and plans of their arrangement on the tarsi, were mentioned, with the different insects on which the author had met with them.

The strong resemblance in the structure of the bilobed Dipterous pulvillus to the almost equally cleft third joint in *Curculio* and *Chrysomela*, which are both furnished with these spathulate appendages, led the author to throw out the suggestion that the former was, in a homological sense, a modified joint. The principal difficulty in accepting such a view (namely, the position of the claws) was combated by showing that the latter are themselves only modified hairs, usually converted into hooks to serve a special purpose*. In

* Since the above was written, the author has had the opportunity of examining the feet of the Ephemera in the living fly, and has ascertained the curious fact, that whilst one of the ungues remains in its normal condition as a strongly curved, horny hook, the other is converted into a soft fleshy sucker.

the hind legs of some aquatic insects, when they are not used either as aids to progression or for the capture of prey, the claw-hairs are scarcely distinguishable from other hairs by which they are surrounded. The five "supplementary claws" (slightly modified hairs) of *Epeïra*, and still more noticeably the claws found by the author along the entire under surface of the tarsi of *Pholcus phalangioides*, were mentioned as supporting this view.

This, the first portion of the paper, after recalling the brilliant researches of Professor Huxley on various dissimilar tegumentary structures formed from hairs in the higher animals, concluded with a few reflections on the equally remarkable series of modifications of the same essential part in the Articulata.

In the second portion of the paper the structure of sucking-disks of a more complicated nature was somewhat minutely treated.

The most complex in structure was stated to occur in the feet of the Wasp, Hornet, and some of the Bees, in which it is a single central organ, situated beneath the ungues. Its various parts were described, with their appearance whilst in action. It was stated that in some, as the Hymenoptera, the whole organ was soft and contractile, to enable it to be readily put away out of danger, as well as preserved in efficient condition for action when required. It was believed that the whole of the Lepidoptera were also furnished with a similar organ, but that, being of firmer consistency in them, it was less liable to injury ; and the author had been unable to satisfy himself that, in any of this tribe, it possessed such an amount of contractility.

The bifid sucker of *Malachius æneus* in the Coleoptera, and of several of the Pentatomidæ amongst the Hemiptera, was then described, together with the hood-like sucker ("vesicle" of authors) terminating the tarsi in *Thrips*, in various species amongst the Cecropidæ, and in many of the Acarida. Several Tipulidæ were mentioned as presenting the only instances of a sucker beneath the claws amongst the Diptera.

The idea was broached that the terminal sucking-disk was perhaps an additional tarsal joint modified to serve a special purpose.

The paper was illustrated by numerous drawings and specimens ; one of the latter, a beetle, possessed of as perfect powers of walking on glass as a fly, was shown living.

Notice on the Habits of the "Agricultural Ant" of Texas ["Stinging Ant" or "Mound-making Ant," *Myrmica* (*Atta*) *malefaciens*, Buckley]. By GIDEON LINCECUM, Esq., M.D. Communicated by CHARLES DARWIN, Esq., F.R.S., F.L.S.

[Read April 18, 1861.]

THE following is merely an abstract of Dr. Lincecum's communication, containing only what appears to be most remarkable and novel in it in the way of observation.

"The species which I have named 'Agricultural,' is a large brownish Ant. It dwells in what may be termed paved cities, and, like a thrifty, diligent, provident farmer, makes suitable and timely arrangements for the changing seasons. It is, in short, endowed with skill, ingenuity, and untiring patience sufficient to enable it successfully to contend with the varying exigencies which it may have to encounter in the life-conflict.

"When it has selected a situation for its habitation, if on ordinary dry ground, it bores a hole, around which it raises the surface three and sometimes six inches, forming a low circular mound having a very gentle inclination from the centre to the outer border, which on an average is three or four feet from the entrance. But if the location is chosen on low, flat, wet land liable to inundation, though the ground may be perfectly dry at the time the ant sets to work, it nevertheless elevates the mound, in the form of a pretty sharp cone, to the height of fifteen to twenty inches or more, and makes the entrance near the summit. Around the mound in either case the ant clears the ground of all obstructions, levels and smooths the surface to the distance of three or four feet from the gate of the city, giving the space the appearance of a handsome pavement, as it really is. Within this paved area not a blade of any green thing is allowed to grow, except a single species of grain-bearing grass. Having planted this crop in a circle around, and two or three feet from, the centre of the mound, the insect tends and cultivates it with constant care, cutting away all other grasses and weeds that may spring up amongst it and all around outside of the farm-circle to the extent of one or two feet more. The cultivated grass grows luxuriantly, and produces a heavy crop of small, white, flinty seeds, which under the microscope very closely resemble ordinary rice. When ripe, it is carefully harvested, and carried by the workers, chaff and all, into the granary cells, where it is divested of the chaff and packed away.

The chaff is taken out and thrown beyond the limits of the paved area.

"During protracted wet weather, it sometimes happens that the provision stores become damp, and are liable to sprout and spoil. In this case, on the first fine day the ants bring out the damp and damaged grain, and expose it to the sun till it is dry, when they carry it back and pack away all the sound seeds, leaving those that had sprouted to waste.

"In a peach-orchard not far from my house is a considerable elevation, on which is an extensive bed of rock. In the sand-beds overlying portions of this rock are fine cities of the Agricultural Ants, evidently very ancient. My observations on their manners and customs have been limited to the last twelve years, during which time the enclosure surrounding the orchard has prevented the approach of cattle to the ant-farms. The cities which are outside of the enclosure as well as those protected in it are, at the proper season, invariably planted with the ant-rice. The crop may accordingly always be seen springing up within the circle about the 1st of November every year. Of late years however, since the number of farms and cattle has greatly increased, and the latter are eating off the grass much closer than formerly, thus preventing the ripening of the seeds, I notice that the 'Agricultural Ant' is placing its cities along the turn-rows in the fields, walks in gardens, inside about the gates, &c., where they can cultivate their farms without molestation from the cattle.

"There can be no doubt of the fact, that the particular species of grain-bearing grass mentioned above is intentionally planted. In farmer-like manner the ground upon which it stands is carefully divested of all other grasses and weeds during the time it is growing. When it is ripe the grain is taken care of, the dry stubble cut away and carried off, the paved area being left unencumbered until the ensuing autumn, when the same 'ant-rice' reappears within the same circle, and receives the same agricultural attention as was bestowed upon the previous crop,—and so on year after year, as I *know* to be the case, in all situations where the ants' settlements are protected from graminivorous animals."

In a second letter, Dr. Lincecum in reply to an inquiry from Mr. Darwin, whether he supposed that the ants plant seeds for the ensuing crop, says, "I have not the slightest doubt of it. And my conclusions have not been arrived at from hasty or careless observation, nor from seeing the ants do something that looked a little like it, and then guessing at the results. I have at

all seasons watched the same ant-cities during the last twelve years, and I know that what I stated in my former letter is true. I visited the same cities yesterday, and found the crop of ant-rice growing finely, and exhibiting also the signs of high cultivation, and not a blade of any other kind of grass or weed was to be seen within twelve inches of the circular row of ant-rice."

In his second letter Dr. Lincecum proceeds to give some account of what he terms the "Horticultural Ant," which appears to be identical with the "Cutting Ant," *Œcodoma mexicana*, Sm., described by Mr. S. B. Buckley in the 'Proceedings of the Academy of Natural Sciences of Philadelphia,' 1860, p. 233 *; but as his account does not contain any important additional observations, it is here omitted.

Mr. Buckley also describes *(l. c.* p. 445), the "Agricultural" or "Mount-making Ant," although his account of its habits will be found to differ in several respects from that given by Dr. Lincecum.

Descriptions of some New Species of Ants from the Holy Land, with a Synonymic List of others previously described. By Frederick Smith, Esq., Assistant in the Zoological Department, British Museum. Communicated by Danl. Hanbury, Esq., F.L.S.

[Read April 4, 1861.]

The ants which form the subject of the present paper were collected in Syria and Palestine by Dr. J. D. Hooker and Mr. Daniel Hanbury, during a visit of a few weeks to those countries in September and October last. The species, though only ten in number, are part of a fauna replete with interest: all the productions, in fact, of the Holy Land are so worthy of our attention, that he who adds even the smallest number of species to the list does not work in vain.

I am not prepared to say how many, or even if any, of the species of Ants forming the present list have been recorded as indigenous to Palestine; but in one or two cases the knowledge of the geographical distribution of ants is rendered highly interesting. Not only do we here find species common to Southern Europe, but in *Formica brunnea* and *Tapinoma erratica* we recognize insects found even in the vicinity of our own metropolis. A few observa-

* A notice of this paper will be found in the Annals & Mag. Nat. Hist. 3 ser. vi. p. 386.

tions on the habits of one or two species are added in the hope of contributing to the dissemination of a knowledge of the marvellous history of the economy of this most interesting family of insects.

Fam. FORMICIDÆ, *Leach.*

Gen. Formica, *Linn.*

Formica compressa. *F.* nigra, thorace compresso, antennis apice femoribusque rufis, capite maximo.

Formica compressa, *Fabr. Ent. Syst.* ii. 353. 2.; *Latr. Fourm.* p. 111.

This species is found in Egypt, in most parts of India, in China, and I have also seen examples from the Philippines. The *worker major* differs greatly in form from the *worker minor*; it is nearly seven lines in length, is black, with the base of the legs pale red, its head being larger and wider than the abdomen. The other form of the worker is smaller, the thorax and legs pale, the head oblong and narrower than the abdomen, the latter being frequently more or less pale at the base. Taken on the north shore of the Dead Sea.

Formica viatica. Sanguinea, opaca, antennis pedibusque rufo-brunneo; abdomine nigro-fusco.

Formica viatica, *Fabr. Ent. Syst.* ii. 356. 27; *Syst. Piez.* p. 404. 33. ☿.—Formica bicolor, *Fabr. Ent. Syst.* ii. 351. 5; *Syst. Piez.* p. 398. 8. ♂.—Formica megalochola, *Foerst. Verh. d. naturh. Ver. d. Rheinl.* vii. 485. ☿.—Cataglyphis Fairmairei, *Foerst. Verh. d. naturh. Ver. d. Rheinl.* vii. 485. ♂.—Monocombus viaticus, *Mayr, Form. Austr.* p. 110. 1.

This ant and the *Atta cephalotes*, according to the information that I have been able to obtain, are usually, if not always, found in the same localities; and it would appear that, in some degree, they are dependent on each other. It is now a well-ascertained fact, that other species, in the fulfilment of their economy, require the aid of a distinct race, or rather are dependent on slave-labour for the rearing of their young brood, and for the performance of many other offices connected with the duties of their formicarium.

The connexion between the *F. viatica* and *Atta cephalotes* appears to be similar to that which exists between *F. sanguinea* and *F. fusca*. The substance of the following account was communicated by M. Roussel to Dr. Nylander. M. Roussel observes that both species are common in Algeria, that they live in numerous societies, and construct their formicaria usually in banks, frequently at road-sides. It would appear that fierce combats take place occasionally between the *Formicæ* and the *Attæ*, the former being always victorious, and carrying off captive numbers of the *Attæ*, which henceforth become the nurse-slaves of *F. viatica*. M. Roussel frequently observed evidences of fierce encounters between these species of ants, having found the ground in the vicinity of the nests of the *Attæ*

strewed with the mangled remains of both combatants; but he does no appear to have ascertained whether the *F. viatica* carries off the *Atta* in the pupa or perfect condition. Probably the former, since, judging from analogy, it would appear necessary that such should be the case, as under such circumstances the *F. fusca* in the nest of *F. sanguinea* appears to form, as it were, an absolutely necessary part of the community. Probably such perfect individuals as are sometimes carried off by slave-making ants, are not intended to form part of the living population. Mr. Bates, who resided several years in Brazil, communicated to me some very interesting accounts of the habits of various predaceous species of ants. Not only did he observe the slave-makers carrying off pupæ from the nests of more peaceable communities, but he also witnessed the slaughter of the defenceless species—their furious assailants tearing the larger and more weighty females limb from limb, and then carrying away the mangled remains to their own habitations. Such, probably, is the fate of such living examples as may be frequently observed vainly struggling with their more warlike invaders.

M. Roussel observed *Atta cephalotes* in great numbers, living in perfect harmony, in the nests of *F. viatica*.

Formica brunnea. *F.* fusco-nigra, cinereo-micans; antennis pedibusque pallide testaceis; squama leviter emarginata.

Formica brunnea, *Latr. Fourm.* p. 169, pl. 6. fig. 35. ♀.—Formica timida, *Foerst. Hym. Stud. Form.* p. 35. 15.

A most widely distributed species, being found in England, France, Germany, Austria, Italy, Algeria, and also in Palestine. Specimens from North America have also been examined, which I am unable to separate from this species.

Formica bipartita. *F. operaria.* Rufo-ferruginea; metathorace spinis duabus acutis minutis; abdomine nigerrimo nitido.

Worker. Length 2 lines. The head, thorax, and legs rufo-ferruginous, smooth and slightly shining, the eyes black; the thorax much compressed behind; the metathorax obliquely truncate, concave above; the lateral margins acute, terminating posteriorly in an acute angle, or short spine; the scale of the peduncle oblong, notched above, inclining forwards, and fitting into the oblique slightly concave truncation of the metathorax: when viewed sideways, it is wedge-shaped; the abdomen ovate, and shining black.

I at first sight mistook this very distinct, and apparently undescribed ant, for a species belonging to the genus *Myrmica*, to many of which it bears a strong resemblance. In size, general form, and more particularly its spinose metathorax, it approaches the *Myrmicidæ*; but its having a single scale, or node, at once points out its situation to be amongst the *Formicidæ*. I much regret having only workers for examination; and although upwards of thirty were captured, not one possesses an antenna. Had all the sexes been before me, I have a strong impression that this

species would have been found to form a new genus, intermediate between *Formica* and *Myrmica*. Future observation and research will probably supply the materials for deciding this interesting question.

Gen. Tapinoma, *Foerst.*

Tapinoma erratica. *T.* nigro-fusca, nitida, glabra; pedum articulis tarsisque pallidis; squama oblonga depressa.

Formica erratica, *Latr. Hist. Nat. Fourm.* p. 182.—Tapinoma erratica, *Smith, Brit. Fourm.* p. 111. 1.

The collection contained a single example of this species. Its coming from so distant a locality created a doubt of the possibility of its being identical with the species found in this country and throughout Europe; but after the most attentive examination having been given to it, I acknowledge my inability to detect the slightest difference between them.

Fam. MYRMICIDÆ.

Gen. Myrmica, *Latr.*

Myrmica jucunda. *M.* fusco-nigra, nitida; mandibulis antennis pedibusque articulis et tarsis rufo-pallescentibus.

Worker. Length 1½ line. Brownish black, very smooth and shining; the mandibles, anterior portion of the head, the antennæ, tarsi, and articulation of the legs pale testaceous; the eyes small and placed midway at the sides of the head. Thorax narrowed posteriorly, with the division between the meso- and metathorax strongly impressed; the metathorax with two very minute spines; the first node of the abdomen, when viewed sideways, is wedge-shaped, the second globose. Abdomen subovate, widest towards the apex.

Myrmica gracillima. *M.* rufo-pallida, lævis, nitida; abdomine nitido nigro.

Worker. Length 1½ line. Pale rufous, smooth and shining; the head oblong, rather wider than the abdomen; the mandibles stout and armed with four black acute teeth on their inner margin; the eyes small, ovate, and placed in the middle at the sides of the head; club of the antennæ 3-jointed; the antennæ as long as the head and thorax. Thorax compressed, the division between the meso- and metathorax strongly impressed; the metathorax unarmed. Abdomen ovate, black, smooth and shining; the nodes of the peduncle pale rufous, the first elevated above the second; when viewed sideways, wedgeshaped, with the apex blunt, the second globose.

There is a certain similarity in the habit of this small ant that induces me to think it quite possible that it may be only a very diminutive form of the worker of *Atta barbara*.

Myrmica punica. *M.* rufo-pallida; capite longitudinaliter delicatule striato; metathorace parvo, acuto, dentiformi.

Worker. Length nearly 1½ line. Pale red, the legs and antennæ palest; the flagellum of the latter with 3 joints in the club; the head wider than the abdomen, delicately striated longitudinally; the mandibles stout, striated, and furnished with 4 or 5 black teeth on their inner margin; the eyes small, black, and situated about midway at the sides of the head. Thorax, the anterior margin transverse; the division between the meso- and metathorax strongly impressed; the metathorax armed with two short acute spines. Abdomen smooth and shining; the nodes ovate and shining; the thorax and abdomen with a few erect pale hairs.

Gen. Atta, *Fabr.*

Atta barbara. (Formica barbara, *Linn. Syst. Nat.* i. 962. 2; *Fabr. Ent. Syst.* ii. 356. 26; *Syst. Piez.* p. 403. 30.—Formica binodis, *Fabr. Syst. Piez.* p. 405. 39; *Latr. Fourm.* p. 285.—Formica juvenilis, *Fabr. Syst. Piez.* p. 405. 38.—Myrmica capitata, *Losana, Form. Piem.* p. 325.—Formica capitata, *Latr. Fourm.* p. 234. pl. 10. fig. 66. ♀ c. ☿ a.—Atta capitata, *St. Farg. Hym.* i. 173. 1.)

This ant is one of the most widely distributed species; it is also one which varies greatly in colouring; hence has arisen the confusion which the above synonym exhibits. The *F. barbara* of Linnæus is a form of the species which has the head and antennæ red; the *F. juvenilis* of Fabricius is a black variety. The *A. capitata* of Europe, according to Nylander and Mayr, varies from individuals totally black to others having the head and legs red, with the thorax more or less obscurely so. These observations apply to the worker only; the male is, I believe, always black; the female is sometimes, but rarely, as highly coloured as the worker. The numerous specimens from Palestine exhibit various shades of coloration; the majority being, however, more highly coloured than any which I have seen captured in Europe. The head, thorax, legs, and in some instances, the nodes of the petiole also are entirely bright red; of those taken in Jerusalem, some are highly coloured, whilst others are quite black. The species has not been discovered in England, but it is common in many parts of France, Germany, Austria, Hungary, Dalmatia, Italy, Sardinia and Sicily; I have also received it from Portugal. The nests of this ant are frequently much infested by a myrmecophilous beetle, *Pycnidium testaceum*.

Atta structor. (Formica structor, *Latr. Fourm.* p. 236.—Formica lapidum, *Fabr. Syst. Piez.* p. 406. 49 ☿.—Formica rufitarsis, *Fabr. Syst. Piez.* p. 406. 45. ♀.—Atta structor, *St. Farg. Hym.* i. 174. 2.—Myrmica structor, *Nyland. Form. Cr. et d'Algér.* 85. 10, Div. 2.)

This species has not been found in England, but is scattered over great part of Europe, having occurred in France, Italy, Germany, Austria, Dalmatia, and Switzerland; it has also been found in Algeria.

Catalogue of Hymenopterous Insects collected by Mr. A. R. Wallace in the Islands of Ceram, Celebes, Ternate, and Gilolo.

By Frederick Smith, Esq., Assistant in the Zoological Department, British Museum. Communicated by W. W. Saunders, Esq., V.P.L.S., &c.

[Read June 6, 1861.]

Of the extensive and valuable additions which Mr. Wallace has made to our knowledge of the geographical distribution of the various genera of Aculeate Hymenoptera, none are perhaps more interesting than those contained in the present paper. Two fine new species of the parasitic genus *Thynnus*, from Gilolo, are especially interesting; this being the extreme limit of the known northern range of that genus from its metropolis, Australia. I would also particularly direct attention to a second species of the genus *Methoca* from Celebes. This genus, long represented by a single European species, was supposed to be confined to that quarter; but during the last few years it has been discovered in North America, two species being described by Say, and one by myself, from that country, one species from Cuba, another from India, and two by Mr. Wallace from the Island of Celebes.

Many fine additions to the Formicidæ, as well as to the fossorial division of the Aculeata, are contained in the present collections, which are the property of William Wilson Saunders, Esq.

Fam. FORMICIDÆ, *Leach*.

Gen. Formica, *Linn.*

1. Formica lactaria, *Smith, Proc. Linn. Soc.* Supp. v. 95. 6.
Hab. Gilolo, Bachian.

2. Formica quadriceps, *Proc. Linn. Soc.* iv. 137. 9.
Hab. Ceram, Aru.

3. Formica consanguinea. *F.* capite abdomineque nigro-fuscis; antennis, thorace, abdomine, squamula pedibusque ferrugineis.

Worker. Length 3 lines. Head black, with a slight ferruginous tinge and a prismatic lustre in various lights; before the insertion of the antennæ it is red as well as the mandibles and antennæ; the latter slender and a little longer than the thorax. The thorax narrow, and much compressed behind; and, as well as the legs, of a bright pale ferruginous. Abdomen ovate, fuscous and thinly sprinkled with pale hairs; the scale of the peduncle ferruginous, small, narrow, upright, with the superior margin rounded.

Hab. Celebes (Tondano).

This is probably the worker minor of *F. virulens*.

4. Formica circumspecta. *F.* rufo-picea, antennis pedibusque pallide ferrugineis; squamula subquadrata, supra emarginata (*fœmina*). *F.* pallide ferruginea, elongata et gracilis; abdomine rufo-fusco (*operaria*).

Female. Length 6½ lines. Rufo-piceous, smooth and shining, the anterior part of the head, its anterior margin, the scutellum and base of the abdominal segments of a brighter colour; the antennæ, legs, and scale of the peduncle pale rufo-testaceous; the head oblong, narrowed anteriorly, transverse behind, and slightly emarginate in the middle; the mandibles stout, punctured, and with a row of black acute teeth on their inner margin; the head slightly punctured in front; the scale of the peduncle subquadrate, slightly emarginate above.

Worker major. 3½ lines. Of a pale ferruginous, with the posterior portion of the abdomen fuscous; head oblong, narrowed behind the eyes; thorax oblong, narrow, compressed behind; the scale of the peduncle small, narrow, with the superior margin rounded above; the thorax narrowed anteriorly, forming a sort of neck.

The *worker minor* is 2 lines in length, more slender than the larger worker, with the antennæ and legs much more elongate, the head narrowed behind, and the thorax prolonged into a sort of neck when viewed sideways.

Hab. Celebes (Tondano).

5. Formica leucophæa. *F.* nigra, dense cinerea, pilosa; thorace postice attenuato; squama oblongo-ovata.

Worker. Length 3 lines. Black and densely covered with a fine silky cinereous pile; antennæ nearly as long as the body, slender, and filiform, the flagellum scarcely thickened towards the apex; eyes rather large and prominent, and situated high on the sides of the head; head oblong, narrowed behind the eyes. Thorax oblong, narrowed and of equal width behind the prothorax; legs very obscurely reddish, with the apical joints of the tarsi rufo-testaceous. Abdomen ovate, the apical margins of the segments testaceous; the scale of the peduncle narrow, small, and pointed above.

Hab. Celebes (Tondano).

6. Formica tropica. *F.* nigerrima, nitida, lævissima; thorace pubescente, postice compresso; pedibus rufo-nigris.

Worker. Length 3¼ lines. Jet black, smooth, shining, and having a faint prismatic lustre, particularly on the head, which is oblong, or subquadrate; the tips of the mandibles ferruginous. The prothorax rounded at the sides and in front; a deep constriction at the base of the metathorax, which is elevated and rounded above; the thorax has a loose long pale scanty pubescence, probably much more dense in specimens in fine condition; the legs very obscurely ferruginous, nearly black; the legs, particularly the tibiæ, have a thin long loose

pale pubescence. Abdomen thinly sprinkled with pale hairs; the scale of the peduncle rounded and blunt above, not much elevated.

Hab. Gilolo.

7. Formica virulens. *F.* capite, thorace pedibusque rufo-ferrugineis; abdomine nigro; squama oblongo-ovata.

Worker. Length 4 lines. Head, antennæ, thorax, and legs rufo-ferruginous; the head very large, much wider than the abdomen, emarginate behind, and rounding at the sides to the tips of the mandibles; the latter triangular, stout, and longitudinally striated, their inner margin dentate. The thorax compressed behind. Abdomen shining, black, with the margins of the segments ciliated with pale hairs; the scale of the petiole oblong-ovate.

Hab. Celebes (Tondano).

8. Formica (Tapinoma) gibba. *F.* castaneo-rufa; antennis, tibiis tarsisque fuscis; metathorace supra rotundato, postice truncato.

Worker. Length 1¾ line. Dull chestnut red; the head rounded behind the eyes, the latter ovate, and situated rather more inwards than is usual, the eyes are also rather large; the antennæ, tibiæ, and tarsi fuscous; the antennæ inserted rather wide apart, nearly in a line with the inner margins of the eyes. Thorax, sub-rugose above, narrowed posteriorly, and deeply constricted between the meso- and metathorax; the latter elevated, rounded above, and truncate behind, the truncation obliquely concave. Abdomen ovate, produced anteriorly over the node of the peduncle, which is oblique, and falls into the truncation of the metathorax.

Hab. Celebes (Tondano).

This species belongs to Foerster's genus *Tapinoma*.

9. Formica (Tapinoma) albipes. *F.* nigra, subnitida, glabra; metathorace dorso abbreviato; squama oblongo-depressa; pedum articulis tarsisque albis.

Worker. Length 1¼ line. Black, slightly shining; the antennæ inserted widely apart on the front of the head; the metathorax oblique behind; the scale of the peduncle decumbent and hidden beneath the base of the abdomen, which projects forwards; the tarsi white.

Hab. Celebes (Tondano).

Gen. Polyrhachis, *Smith* *.

1. Polyrhachis hastatus, *Latr. Hist. Nat. Fourm.* p. 129, pl. 4. fig. 23, ♀.

Hab. Celebes; India.

The specimen from Celebes has the metathoracic spines shorter than Indian specimens which I have seen, and those on the node of the peduncle are also rather shorter; however, in its opake blackness and in every other particular the insect is identical.

* A figure of the scale of the peduncle of each of the new species described will be found on Plate I., illustrative of this paper.

2. Polyrhachis bihamatus, *Drury, Ins.* ii. pl. 38. f. 8, ☿.
Hab. Celebes; Bachian; Sumatra; Borneo; India; Ceram.

3. Polyrhachis Merops, *Smith, Proc. Linn. Soc. Supp.* v. 98. 9.
Hab. Celebes; Bachian.

4. Polyrhachis Busiris, *Smith, Proc. Linn. Soc. Supp.* v. 98. 7, ♀.
Hab. Celebes; Bachian.

5. Polyrhachis bicolor, *Smith, Cat. Hym. Ins.* pl. 6 (*Formicidæ*), p. 65. 25.
Hab. Ternati; Burmah.

6. Polyrhachis rugifrons, *Smith, Proc. Linn. Soc. Supp.* v. 70. 3.
Hab. Ceram; Makassar.

7. Polyrhachis rufofemoratus, *Smith, Proc. Linn. Soc.* iii. 142. 14.
Hab. Ceram; Aru.

8. Polyrhachis Orsyllus. *P.* niger, cinereo-sericeo vestitus; thorace supra deplanato; spinis duabus acutis antice armato; squama integra; tibiis ferrugineis.
Worker. Length 3 lines. Black and thinly clothed with silky cinereous pile; the extreme apex of the flagellum and the palpi pale rufo-testaceous. The head and thorax above longitudinally and delicately striated; the margins of the thorax acute and slightly raised; the spines on the prothorax short, stout, and acute; the tibiæ ferruginous, the posterior pair rather dusky. Abdomen globose, the node of the peduncle broad, with its superior margin rounded, not spined. (Pl. I. fig. 6.)
Hab. Celebes (Tondano).

9. Polyrhachis Mutiliæ. *P.* niger; capite thoraceque cinereo-sericeo vestitis; abdomine pallide-aureo tectis; thorace spinis acutis duabus antice et postice armato; squama spinis duabus longis curvatis.
Worker. Length 2½ lines. Black, the head and thorax with a thin silky cinereous pile, that on the abdomen of a pale golden hue, the antennæ and legs black without pile, and slightly shining. Thorax convex above, the anterior spines short, slender and acute; the metathoracic spines rather longer but equally slender and acute; the node of the peduncle with two long spines which are curved to the shape of the base of the abdomen; the latter globose. The thorax flattened transversely, but curved longitudinally. (Pl. I. fig. 7, and fig. 15 var.?)
Hab. Celebes (Tondano).

10. Polyrhachis Olenus. *P.* niger; thorace supra deplanato, spinis duabus acutis anterioribus; squama spinis duabus longis armata; corpore aureo-sericeo vestito.
Worker. Length 3 lines. Black and clothed with ashy silky pile; the palpi pale rufo-testaceous. Thorax flattened above, with the lateral

margins raised, armed in front with two divergent flattened acute spines; the metathorax truncate, and with the margin at the verge of the truncation acute and slightly raised; the node of the peduncle armed with two long acute divergent spines which curve backwards over the base of the abdomen; the latter globose. (Pl. I. fig. 8.)

Hab. Celebes (Tondano).

11. Polyrhachis Democles. *P.* niger, aureo-sericeo vestitus; thorace ovato, metathorace spinis duabus brevibus obtusis; squama spinis duabus acutis armata.

Female. Length 3½ lines. Black, covered with golden pubescent pile, the head and thorax thinly so. The thorax ovate; the verge of the truncation of the metathorax notched, the lateral angles forming short blunt spines; the node of the peduncle with two acute short spines, and in the middle of its upper margin with a notch, the angles of which are slightly elevated, forming two minute teeth or spines; the abdomen globose; the legs black and shining. (Pl. I. fig. 9.)

Hab. Celebes (Tondano).

12. Polyrhachis Valerus. *P.* capite abdomineque nigris; thorace, squama femoribusque rufis; thorace quadrispinoso; petioli squamula bispinosa.

Worker. Length 3¼ lines. Black, with the thorax, scale of the petiole, the coxæ, trochanters and femora ferruginous; the head opake, the face with short cinereous pubescence. The thorax with a thin shining cinereous pile; the spines on the thorax in front short, stout, and acute; the metathorax with two long slightly divergent spines directed backwards and tipt with black; the node of the peduncle with two long acute spines directed backwards over the base of the abdomen, their apex black. Abdomen globose and covered with silky pile, the extreme base, ferruginous. (Pl. I. fig. 10.)

Hab. Celebes (Tondano).

13. Polyrhachis trispinosus. *P.* niger, lævis nitidusque; thorace inermi; petioli squama trispinosa.

Female. Length 4 lines. Jet black, smooth and shining; the antennæ long and slender with the apical half ferruginous; the front of the head very convex. Thorax ovate, very delicately striated, the striæ, short and irregular, may be called a faint scratching; wings wanting; the node of the peduncle with three short acute spines above; the claws of the tarsi rufo-testaceous. Abdomen ovate and very smooth and shining. (Pl. I. fig. 11.)

Hab. Celebes (Tondano).

14. Polyrhachis Diaphantus. *P.* niger et vestitus pube argentea; thorace quadrispinoso; petioli squamula bispinosa.

Worker. Length 2½ lines. Black, and densely clothed with silky silvery pile; the flagellum has the tips of the basal joints, and six or

seven of the apical joints entirely ferruginous; the thorax convex above, the anterior spines short, stout, and acute; the metathorax with two very stout, acute divergent spines; the node of the petiole with two long spines very stout, acute, and curving round the base of the abdomen; the abdomen globose. The anterior tibiæ obscurely ferruginous, their base black. (Pl. I. fig. 12.)

Hab. Celebes (Tondano).

15. Polyrhachis Amanus. *P.* niger, lævis, nitidus; thorace antice et postice spinis duabus longis acutis armato; squama spinis duabus longis curvatis; femoribus basi pallide ferrugineis.

Worker. Length 3 lines. Jet black, smooth and shining, the thorax finely roughened and sub-opake; head very prominent in front, tips of the mandibles and of the joints of the flagellum, as well as the palpi, rufo-testaceous, five or six of the apical joints of the flagellum entirely so. Thorax, the spines in front short, stout, acute, and curved inwards; those on the metathorax elongate, extending over the base of the abdomen and very acute; the spines on the node of the peduncle slender, very acute, and curved to the shape of the base of the abdomen; legs elongate, obscurely ferruginous, with the coxæ, trochanters, and base of the femora pale testaceous, the claws of the tarsi testaceous. Abdomen globose, highly polished and impunctate. (Pl. I. fig. 13.)

Hab. Celebes (Tondano).

16. Polyrhachis Cleophanes. *P.* niger, pube argentea vestitus; capite thoraceque rude punctatis, spinis acutis antice et postice armatis; petioli squamula bispinosa; femoribus basi ferrugineis.

Worker. Length 3¼ lines. Black, the abdomen shining; head and thorax coarsely and closely punctured, rugose, and covered with silvery pubescent pile; the prominence on the front of the head, under the sides of which the antennæ are inserted, very much elevated; the eyes very prominent; the spines on the thorax in front short, divergent, stout, and acute; those on the metathorax more slender, acute, and curved backwards; the node of the peduncle with acute spines, which curve backwards over the base of the abdomen; the base of the femora more or less ferruginous, sometimes totally black. (Pl. I. fig. 14.)

Hab. Celebes (Tondano).

This is very probably the worker of *P. Vibidia*.

17. Polyrhachis exasperatus. *P.* niger, capite thoraceque rude punctatis, abdomine nitido; thorace antice et postice spinis duabus longis acutis armato; squama spinis duabus longis curvatis acutis armata; pedibus obscure ferrugineis.

Worker. Length 2¾ lines. Black; the head anteriorly, the mandibles and flagellum obscure ferruginous; the head, thorax, and node of the

peduncle very coarsely and closely punctured, producing a rugged surface. The thorax, with two short stout acute spines bent inwards, the metathorax with two long divergent acute spines; the peduncle with two long acute spines, which curve to the shape of the base of the abdomen; the legs ferruginous, more or less obscurely so. The abdomen globose, smooth, and shining. (Pl. I. fig. 15, and 16 var.)

Hab. Celebes (Tondano).

18. Polyrhachis Vibidia. *P.* niger, capite thoraceque rude punctatis; thorace ovato, antice posticeque abdominisque squama spinis duabus acutis armatis; abdomine ovato.

Female. Length 3½ lines. Black; the head and thorax with large deep punctures; the head with a large prominence in front, the lateral margins of which are expanded into elevated flat scales, beneath which the antennæ are inserted, the extreme tip of the latter pale rufo-testaceous; the eyes very prominent. Thorax ovate, with a short stout spine on each side in front; the metathorax with two stout acute spines, rather longer than the front ones; the node of the peduncle with two short divergent acute spines; the tibiæ and femora ferruginous, the apex of the latter and base of the former dusky or black; the claws of the tarsi rufo-testaceous. Abdomen globose, smooth and shining; the entire insect thinly covered with cinereous pubescent pile. (Pl. I. fig. 17.)

Hab. Celebes (Tondano).

19. Polyrhachis Chaonia. *P.* niger, pube pallide aurea vestitus; thorace bidentato; petioli squamula bidentata; femoribus tibiisque ferrugineis; alis fusco-hyalinis.

Female. Length 4 lines. Black, and clothed with a cinereous pubescence, which has a pale golden lustre, particularly on the head and thorax; that on the abdomen is more inclining to grey, but has a golden tint in some lights; the mandibles black. Thorax armed in front with two short acute spines; the legs ferruginous, with the tarsi black; wings fusco-hyaline, nervures testaceous. Abdomen globose; the scale of the peduncle with two short stout spines. (Pl. I. fig. 18.)

Hab. Gilolo.

20. Polyrhachis Numeria. *P.* niger; thorace supra deplanato, spinis duabus anterioribus; abdominis squamula spinis duabus erectis acutis, utraque ad basin minute unispinulosa.

Worker. Length 3 lines. Black, and covered with silky cinereous pile; the thorax flattened above, and slightly curved longitudinally to the verge of the truncation of the metathorax, the spines on the prothorax stout, short and acute; the margins of the thorax slightly raised. Abdomen globose, truncate at the base; the node of the peduncle broad, transverse above with an erect spine at each lateral

angle, and a shorter acute spine outside at their base. (Pl. I. fig. 19.)

Hab. Celebes (Tondano).

21. Polyrhachis Hippomanes. *P.* niger; capite thoraceque opacis; abdomine nitido; thorace spinis duabus longis acutis postice armato; squama spinis duabus longis curvatis armata.

Worker. Length $2\frac{1}{4}$ lines. Black, the head and thorax opake, and obscurely tinged with blue. Thorax rounded above, the anterior margin unarmed; the metathorax with two long divergent spines; the node of the peduncle with two similar spines, which are curved and extend over the base of the abdomen; the trochanters and the intermediate and posterior coxæ pale rufo-testaceous; the legs elongate. The abdomen globose. (Pl. I. fig. 20.)

Hab. Celebes (Tondano).

22. Polyrhachis Lycidas. *P.* niger, pubescens; thorace supra deplanato, spinis duabus anterioribus; petioli squamula quadrispinosa.

Worker. Length 4 lines. Black with a thin silky cinereous pile, and sprinkled over with erect pale pubescence, which covers the antennæ and legs also; the extreme tip of the antennæ pale rufo-testaceous, the palpi of the same colour; the head and thorax longitudinally striated; the prothorax with two stout acute spines; the margins of the thorax slightly elevated and extremely acute at the angles of the truncation of the metathorax, sub-dentate; the node of the peduncle with four acute spines. Abdomen globose, with the base truncate. (Pl. I. fig. 21.)

Hab. Celebes (Tondano).

23. Polyrhachis Zopyrus. *P.* niger; prothorace bispinoso; petioli squamula quadrispinosa.

Worker. Length $2\frac{3}{4}$ lines. Black, with a thin cinereous silky pile. Thorax, the anterior margin transverse, with the lateral angles very acute, and slightly produced into short acute spines; the sides of the thorax flat, the disk slightly convex, with the margins acute and slightly raised; the metathorax truncate, the angles of the truncation slightly produced, forming short acute spines; the anterior tibiæ more or less ferruginous within. Abdomen globose, the node of the peduncle with the superior margin transverse, the lateral angles raised into short acute teeth or spines; the sides of the node oblique outwardly, then abruptly inclined inwards to its base; at the angle thus produced is a short acute spine. (Pl. I. fig. 22.)

Hab. Celebes (Tondano).

24. Polyrhachis Eurytus. *P.* niger cinereo-sericeo vestitus; thorace subovato, spinis duabus antice armato; squama emarginata.

Female. Length $3\frac{3}{4}$ lines. Black, and covered with silvery grey pile, which is most dense on the face, metathorax, and abdomen. Thorax

sub-ovate, the metathorax truncate with the margin of the truncation acute; the prothorax with two short acute spines. Abdomen globose; the node of the peduncle widely emarginate above and subdentate at the angles. (Pl. I. fig. 23.)

Hab. Celebes (Tondano).

Gen. Odontomachus, *Latr.*

1. Odontomachus rixosus, *Smith, Proc. Linn. Soc.* ii. 64. 1.

Hab. Ternati; Singapore.

2. Odontomachus sævissimus, *Smith, Proc. Linn. Soc.* Supp. v. 102. 1.

Hab. Menado; Bachian; Ceram.

3. Odontomachus tyrannicus. *O.* ferrugineus, lævis nitidus; thorace oblongo, metathorace transversim striato; abdominis pedunculo unispinoso.

Worker. Length 4 lines to the tips of the mandibles. Ferruginous, very smooth and shining; the head widest at the insertion of the eyes, more than usually so; the usual deep depressions between the eyes and the prominence at the sides of which the antennæ are inserted very smooth without the faintest striation, the prominence slightly striated longitudinally; the head deeply emarginate behind; the mandibles finely serrated on their inner margins, and terminating in two stout teeth, which form a fork abruptly bent inwards. The antennæ and legs of a paler colour than the body; the metathorax transversely striated, the mesothorax above longitudinally so; the spine on the node of the peduncle of the abdomen short and acute. (Pl. I. fig. 4.)

Hab. Celebes.

Fam. PONERIDÆ, *Smith.*

Gen. Ponera, *Latr.*

1. Ponera rugosa, *Smith, Proc. Linn. Soc.* ii. 66. 5.

Hab. Celebes; Borneo.

2. Ponera parallela, *Smith, Proc. Linn. Soc.* iv. 143. 3.

Hab. Celebes; Aru.

3. Ponera læviceps, *Smith, Proc. Linn. Soc.* ii. 69. 13 ☿.

Hab. Celebes; Bachian; Borneo.

4. Ponera maligna. *P.* capite subquadrato, margine posteriore transverso; thorace abdomineque lævigatis, nitidis; mandibulis, antennis tarsisque pallide ferrugineis.

Female. Length 5½ lines. Jet-black, smooth and shining; the posterior margin of the head transverse, with the lateral angles acute; the clypeus elevated; the head is sprinkled with distant punctures; its anterior margin, the mandibles, and antennæ ferruginous; the mandibles porrect, with two or three teeth at their apex and a larger one on their inner margin about one-third of their length from their apex.

Thorax oblong-ovate, with a few large scattered shallow punctures; the articulations of the legs and the tarsi ferruginous. Abdomen deeply constricted between the first and second segment, the apex rufo-testaceous; the node of the peduncle incrassate, subquadrate, rather widest behind; the entire insect is sprinkled with pale hairs, which are most dense on the abdomen, particularly at its apex.

Worker. This sex is rather smaller than the female, is less pubescent, and with fewer punctures; the metathorax narrower than the prothorax, and obtuse behind; the eyes are smaller, and, like those of the female, placed forwards at the sides of the head; the mandibles are similarly toothed; the colouring does not differ.

Hab. Celebes; Menado.

5. Ponera nitida. *P.* pallide ferruginea, lævis et nitida; margine mandibularum bidentato.

Worker. Length $2\frac{1}{3}$ lines. Pale ferruginous, very smooth and shining; the eyes small, round, and placed forwards at the sides of the head; the mandibles porrect, with two stout short teeth on their inner margin. Thorax, with the sides flattened, above slightly convex; the metathorax oblong-quadrate above. The node of the peduncle quadrate and incrassate, as wide as the metathorax; the abdomen is constricted between the first and second segments, and has a few pale scattered hairs.

Hab. Celebes (Tondano).

6. Ponera mutabilis. *P.* ferruginea, lævis, nitida, chalybea, viridescens; abdomine rufo-fusco.

Worker. Length $3\frac{1}{4}$ lines. Ferruginous; the head and thorax with tints of blue in certain lights; the mandibles longitudinally and finely striated, armed with three teeth at their apex, and a fourth on their inner margin a little way within; the eyes ovate and placed forwards at the sides of the head. Thorax compressed posteriorly; the scale of the peduncle flattened, rather thick, with its superior margin rounded. Abdomen slightly fuscous; the apical margin of the basal segment slightly constricted.

Hab. Celebes (Tondano).

This species resembles the *P. viridescens* from Sarawak, but is at once distinguished from it by its much shorter and thicker antennæ.

Gen. Ectatomma, *Smith*.

1. Ectatomma rugosa, *Smith, Proc. Linn. Soc.* iii. 143. 1.

Hab. Ceram; Aru.

Fam. MYRMICIDÆ, *Smith*.

Gen. Myrmica, *Latr*.

1. Myrmica molesta, *Say, Bost. Journ. Nat. Hist.* i. 293. 6. (Myrmica domestica, *Shuck. Mag. Nat. Hist.* p. 268.)

Hab. Menado; Celebes; Britain; France; Brazil; North America.

2. Myrmica pedestris. *M.* fusco-nigra; capite thoraceque longitudinaliter striatis; antennis pedibusque ferrugineis; abdomine lævi, nitidissimo.

Female. Length 3 lines. Nigro-fuscous; the head and thorax longitudinally striated, the striæ formed of rows of confluent punctures, the punctures finer on the head than on the thorax; the antennæ, anterior margin of the head and the mandibles ferruginous, the legs ferruginous. The thorax transverse anteriorly; a narrow smooth shining impunctate line runs down the middle; the metathorax unarmed. Abdomen oblong-ovate, smooth, shining, and delicately punctured; the nodes of the peduncle smooth and impunctate, the first oblong, the second globose.

Hab. Celebes (Tondano).

3. Myrmica ruficeps. *M.* fusco-nigra; capite ferrugineo et longitudinaliter striato, thorace supra striato; abdomine lævi, nitidissimo.

Female. Length 4 lines. Black, the head red with a space behind the insertion of the antennæ regularly striated longitudinally, extending to the posterior margin; on each side of the striation the head is rugose; the mandibles stout, smooth and shining, with their inner margin black, smooth, and edentate; flagellum 12-jointed, the club 3-jointed. Thorax, the disk longitudinally striated, the scutellum smooth and shining, with a few transverse striæ behind; the metathorax with two short stout teeth; the tarsi and articulations of the legs pale rufo-testaceous. The petiole of the abdomen ferruginous, the nodes black, the first globose, the second transverse. Abdomen ovate, black, smooth, and shining.

Hab. Celebes (Tondano).

4. Myrmica fuscipennis. *M.* ferruginea; capite thoraceque profunde punctatis; alis nigro-fuscis.

Female. Length 3 lines. Ferruginous, the head and thorax covered with large oblong punctures, the punctures occasionally confluent; the mandibles finely striated longitudinally, their inner margin furnished with a row of small black teeth; the joints of the antennæ, except the three apical ones, transverse; the apical joint longest, but not forming a club. Thorax, the metathorax with two short acute teeth; wings dark fuscous. Abdomen very smooth and shining, and much paler than the head and thorax.

Hab. Celebes (Tondano).

5. Myrmica pertinax. *M.* rufo-fusca, nitida, sparse pilosa; capite longitudinaliter striato; metathorace mutico.

Worker. Length 1½–2 lines. Rufo-fuscous, the head darker than the the body; the anterior portion of the head and the antennæ bright rufo-ferruginous. The thorax smooth and shining, with a few fine punctures, the base and apex of the femora pale in some of the larger and darker examples; the abdomen pale at the base, the ex-

treme apex pale and pubescent. Smaller specimens are usually paler than large ones.

Hab. Celebes (Tondano).

6. Myrmica vexator. *M.* pallide flavo-testacea, lævis, nitidissima; abdomine apice fusco-nigro.

Worker. Length 1 line. Honey-yellow, very smooth and shining; the flagellum slightly fuscous towards the apex; the eyes small and placed forwards at the sides of the head; the metathorax not spined; the abdomen fuscous with the base pale.

Hab. Ternati.

This species resembles the House-ant, *M. molesta*; but it differs in several particulars from that species; its head is much larger, and it is entirely smooth and shining.

7. Myrmica insolens. *M.* testaceo-ferruginea, sparse pilosa; capite thoraceque longitudinaliter striatim rugosis; metathorace spinis parvis acutis armato.

Worker. Length $1\frac{3}{4}$ line. Pale ferruginous; the head and thorax longitudinally, irregularly and roughly striated; the eyes and ocelli black; the antennæ with three joints in the club; the metathorax with two straight acute spines, which are situated at the sides of the truncation of the metathorax; the abdomen smooth and shining.

Hab. Menado.

8. Myrmica opaca. *M.* nigra, opaca, delicatule scabrosa; pedibus rufo-fuscis, tarsis pallide testaceis.

Worker. Length 2 lines. Opake-black, the head, thorax and nodes of the peduncle finely scabrous, on the head having a tendency to run into lines; behind the eyes is a longitudinal groove, apparently for the reception of the scape of the antennæ; the antennæ obscurely ferruginous with the tip pale; the mandibles ferruginous, striated and with several black teeth on their inner margin. Thorax armed posteriorly with two stout curved spines; the tarsi pale rufo-testaceous. The nodes of the peduncle large and globose; the abdomen thinly sprinkled with erect white setæ.

Hab. Celebes (Tondano).

Gen. Cerapachys, *Smith.*

1. Cerapachys antennatus, *Smith, Proc. Linn. Soc.* ii. 74. 1.

Hab. Celebes; Borneo.

Gen. Crematogaster, *Lund.*

1. Crematogaster ampullaris. *C.* rufo-niger; capite thorace multum latiore; parte postica thoracis dilatata; abdomine cordato.

Worker. Length 2 lines. Obscure fusco-ferruginous; the antennæ, sides of the head, the nodes of the petiole, and the legs of a brighter

red; the head much wider than the thorax and more shining; the metathorax much swollen and wider than the prothorax, swelling out on each side. Abdomen heart-shaped, palest at the base and shining.

Hab. Celebes (Tondano).

The swollen metathorax in this species, I apprehend, is a receptacle for saccharine fluid; on each side is a small orifice, and beneath it, adhering to the thorax, are particles of crystallized masses, apparently formed of the fluid which has exuded from the receptacle. Two species from Sarawak, having similar formations, are described in the second volume of the 'Proceedings of the Linnean Society.'

Fam. ATTIDÆ, *Smith.*

Gen. Solenopsis, *Westw.*

1. Solenopsis cephalotes, *Smith, Proc. Linn. Soc.* iii. 149. 1.

Hab. Celebes; Aru.

The *worker major* of this species has the head greatly enlarged, that of the *worker minor* being of the ordinary size.

2. Solenopsis laboriosa. *S.* ferruginea; capite maximo, longitudinaliter striato, postice transverso-striato; spinis metathoracis minutissimis.

Worker major. Length 3 lines. Dark ferruginous, with the legs pale; rufo-testaceous; the head very large, twice as wide as the abdomen, in front and at the sides roughly striated, posteriorly delicately striated; the sides of the head very slightly rounded, emarginate behind with a central impressed line running forwards and terminating opposite the eyes; the eyes very small and placed at the sides a little beyond the middle; the vertex smooth and shining, with a few scattered fine punctures. Thorax sub-rugose, convex anteriorly and shining, behind constricted and narrowed; the metathorax with two short, erect, acute spines. Abdomen smooth, shining and slightly pubescent. The mandibles have a single tooth at their apex.

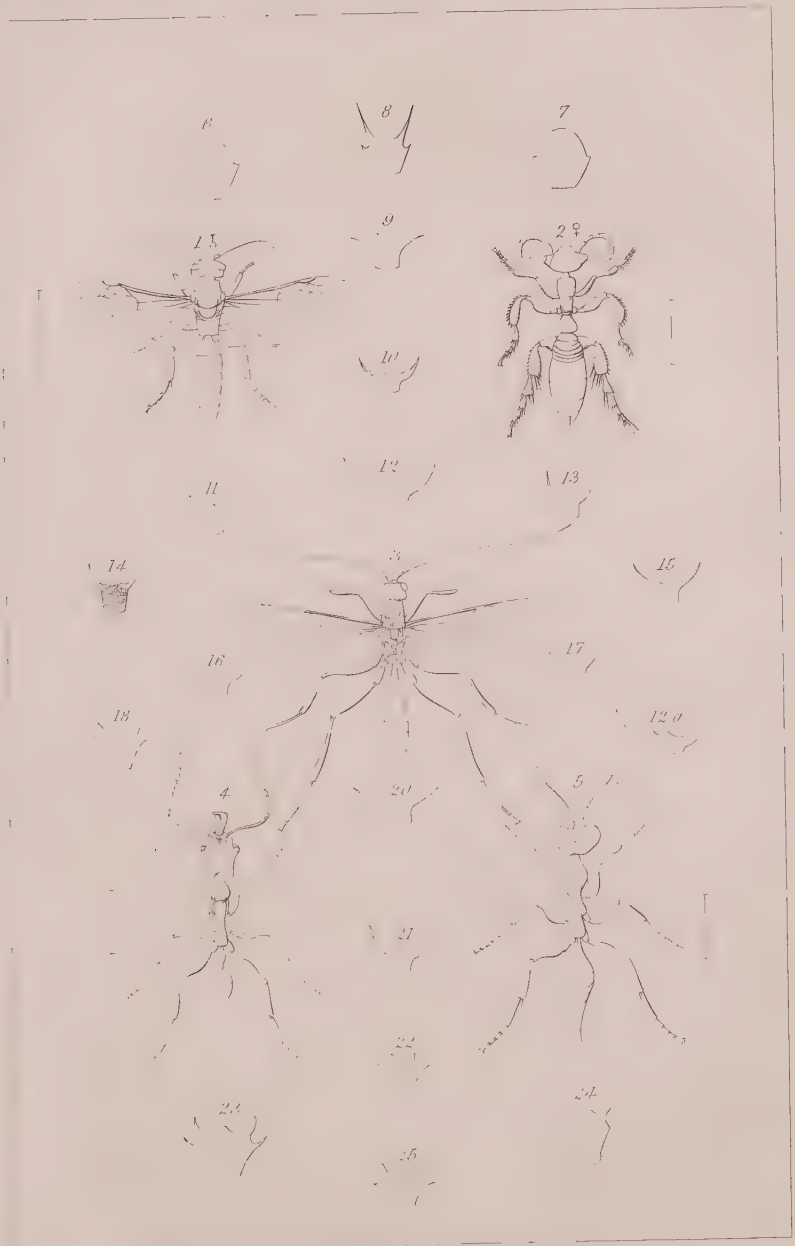
Worker minor. Length 1–2 lines. This form is of a much paler colour, the larger individuals having the abdomen fuscous, except at the extreme base; in the smaller examples it is only fuscous at the apex; in large individuals the head is slightly striated in front, in small ones it is entirely smooth and shining; the head much smaller in proportion than in the *worker major*; the mandibles with two or three teeth on their inner margin.

Hab. Celebes (Tondano).

The different-sized workers were taken from the nest by Mr. Wallace.

3. Solenopsis pungens. *S.* ferruginea; capite maxime longitudinaliter striato; abdomine fusco (*operaria major*): rufo-testacea, lævis, tota nitidissima nuda flagellis pedibusque pallescentibus (*operaria minor*).

Worker. Length 2 lines. Ferruginous, the flagellum and legs pale ferruginous; the mandibles stout, finely punctured and with two



Drawn & Engraved by F. Smith.

JOURNAL OF THE PROCEEDINGS

OF THE

LINNEAN SOCIETY OF LONDON.

On the Vegetation of Clarence Peak, Fernando Po; with Descriptions of the Plants collected by Mr. Gustav Mann on the higher parts of that Mountain. By J. D. Hooker, Esq., M.D., F.R.S., F.L.S., &c.

[Read March 7th, 1861.]

A knowledge of the temperate flora of any spot on the west coast of Tropical Africa has long been one of the greatest desiderata in botanical geography, not only on account of the intrinsic interest that must attach to the plants of the extremely few isolated points so elevated as to possess a temperate climate in that vast humid and torrid area, but also from the light such plants might be expected to throw on the floras of St. Helena, the Cape de Verd, and the Canaries; all of which (and especially the former) contain peculiar endemic genera, whose nearest allies might be expected to exist on the mountains of the neighbouring continent.

Within the last year the outlines of such a desiderated flora have been supplied by the energy and resolution of Mr. Gustav Mann, of the Royal Gardens, Kew, who was appointed by Lord John Russell (Foreign Minister) to succeed the late lamented Barter, as botanist to Dr. Baikie's Niger Expedition, but who, being unable to ascend the river and join that expedition, has devoted a year and a half to exploring the island of Fernando Po, and has twice reached its lofty summits, 10,700 feet above the sea; on both occasions collecting indefatigably and preserving his collections well.

Mr. Mann's account of the first of these ascents has already been read before the Society; he commenced the expedition on the 23rd March, 1860, and reached the summit on the 3rd April, where the temperature fell to 39° at night. The return was accomplished on the 13th of the same month. A second ascent was attempted on the 7th of November, and after eighteen days he had nearly reached the top, when his men rebelled, and he was obliged to return to Clarence. He started a third time, and reached the summit in December, but the dates and detailed narrative of this ascent have not yet arrived.

The following notes chiefly refer to the temperate plants, all but one of which (*Sanicula Europæa*) were collected at or above 5000 feet elevation. They amount to 76 species (in 66 genera), a singularly small number for 5700 feet of vertical height almost under the equator. Of these fully 20 are tropical types that ascend a little above 5000 feet, and must be excluded from the temperate flora. The remaining 56 belong to no fewer than 45 genera; proving the flora to be an extremely fragmentary one.

Of the total 76, 37 are Abyssinian species, and 16 others closely allied to such; and of the 56 temperate, 32 are also natives of the mountains of Abyssinia, most of them being absolutely specifically identical, and others but slightly differing; such differences being in some cases doubtless apparent rather than real, and owing to the want of a larger suite of specimens; 13 others also are very closely allied to Abyssinian species.

Again, of the Abyssinian mountain plants common to Clarence Peak, no fewer than 17 are absolutely peculiar to these two localities as far as is at present known, including some very remarkable plants; as

Clematis Simensis	Stachys aculeolata, n. sp.
Thalictrum rhynchocarpum	Pycnostachys Abyssinica
Sagina Abyssinica	Calamintha Simensis
Trifolium subrotundum	Cyanotis Abyssinica?
—— Simense	Kyllingia macrocephala
Helichrysum chrysocoma	Trisetum lachnanthum
—— Hochstetteri	Festuca Schimperiana
—— globosum	Gymnandropogon, sp.
Blæria spicata	

Besides these are the following, which are not found south of Abyssinia in Africa:—

Galium rotundifolium	Deschampsia cæspitosa
Parietaria Mauritanica	Brachypodium sylvaticum.

Others are common to Abyssinia, the Mauritius, Madagascar, &c.: as

Viola Abyssinica	Rubus apetalus
Hypericum angustifolium	Carex Boryana.
Geranium Simense	

There are, again, other species whose only near affinities are with Abyssinian: as species of

Agrocharis	Plectranthus
Gymnosciadium?	Veronica
Dichrocephala	Euphorbia
Swertia	Habenaria.

Extending the comparison to genera, I find that of the 66 Clarence Peak genera only 7 are not Abyssinian, and of the 45 temperate genera 41 are temperate Abyssinian. Of the 3 remaining, *Luzula* and *Schœnus* may yet be found in Abyssinia, and *Leucothoe* is a Mauritius plant.

The next affinity is with Mauritius, Bourbon, and Madagascar: of the whole 76 species, 16 inhabit these places, and 8 more are closely allied to plants from there. Three temperate species are peculiar to Clarence Peak and the East African Islands, including *Leucothoe angustifolia*, *Sebæa brachyphylla*, and *Carex Wahlenbergiæ*. *Ericinella* and *Leucothoe* are the only genera not Abyssinian, which are common to these islands and to Fernando Po.

Lastly, if compared with the Cape, the contrast is very striking: not only is there a total want of any true Cape types, except such few as are common to Abyssinia or the Eastern African Islands (5 species), but only 12 of the 76 Fernando Po species are known to be South African; and of these all but *Luzula* have been also found in Abyssinia. Only 12 others are nearly related to South African forms. Turning to the genera, *Peddiea* is the only peculiarly South African one; and this is not temperate at Fernando Po, and is subtropical in South Africa.

Hence the result of comparing the Clarence Peak flora with that of the African continent is—1. The intimate relationship with Abyssinia, of whose flora it is a member, and from which it is separated by 1800 miles of absolutely unexplored country*; 2. the curious relationship with the East African Islands, which are still further off; 3. the almost total dissimilarity from the Cape flora.

* This result is strongly in favour of the existence of a chain of mountains crossing Central Africa, from Abyssinia to the Cameroons Mountains, of whose probable existence M. du Chaillu has recently procured evidence.

With the West African Islands again, contrary to my expectations, there is no marked relationship whatever, except obscurely with St. Helena through *Wahlenbergia arguta*: the arborescent *Compositæ* and *Lobeliaceæ*, *Phylicæ*, *Melhaniæ*, *Frankenia*, *Acalypha*, and frutescent *Heydotis* of St. Helena, being wholly unrepresented in Fernando Po.

Taking a still wider range, the temperate flora of Fernando Po belongs to the northern hemisphere. Of the 48 temperate genera, 12 only are not European; whilst the following species are European, and most of them British:—

Oxalis corniculata	Parietaria Mauritanica
Sanicula Europæa	Luzula campestris
Galium Aparine	Deschampsia cæspitosa
—— rotundifolium	Brachypodium sylvaticum.
Limosella aquatica	

The two following are also probably states of European plants:—*Ranunculus pinnatus*, very near *R. philonotis*; *Calamintha Simensis*, near *vulgaris*.

Ranunculaceæ,

Of this Order, which is very far from well-represented, even in the temperate and alpine regions of Tropical and Southern Africa, three genera, each containing a single species, were collected by Mr. Mann on Clarence Peak. All are Abyssinian; one only, and that a plant of very wide distribution, is South African also.

1. Clematis Simensis, *Fresen*; *Rich. Fl. Abyss.* i. 3.

Hab. In Clarence Peak, alt. 4–8000 ped. (fl. Nov.)—Alte scandens, 120-pedalis! Flores albi.

The flowers are a little smaller than the Abyssinian specimens. A. Richard describes this species as glaucous in all its parts, but such is not the case in all our authentically named specimens, nor in these from Fernando Po, which have also more membranous foliage; such differences are what the more humid climate of West Tropical Africa would lead us to expect. The lower parts of the filaments are also rather more silky in Mann's specimens, but this is a variable character. I have no fruiting individuals. This species is found throughout Abyssinia at 8000 feet elevation.

2. Thalictrum rhynchocarpum, *Quart. Dill. & Rich.*; *Rich. Fl. Abyss.* i. 3.

Hab. In Clarence Peak, alt. 10,000 ped.

Herba 12-pedalis. Fl. virides. Stamina numero varia, interdum plurima.

A most remarkable species, and quite unlike any other hitherto described. A. Richard rightly characterizes it as one of the best-marked species of the genus. Mann's specimens are in flower only, and have the pinnules sometimes a little more divided than in Abyssinian ones; it is not uncommon in mountain woods of Abyssinia.

3. Ranunculus pinnatus, *Poir.*, var. *extensa* carpellis lævibus.

Hab. In Clarence Peak, alt. 8500 ped. (fl. Dec.)

Caules graciles, elongati, flexuosi, interdum ad nodos radicantes. *Folia* longe et gracile petiolata, pinnata v. biternata, foliolis longe petiolulatis.

This in every respect agrees with *R. pinnatus*, Poir, of Southern Africa, except in its more drawn-out habit (a feature doubtless attributable to the climate of Fernando Po), and the total absence of any tubercles on the carpels. This last, however, is a variable character, and often wanting in the very closely allied *R. philonotis*, Retz., of Europe, which, with the present and some other plants of India and America, will, I suspect, ultimately prove to belong to one collective, widely diffused species.

Menispermeæ.

1. Stephania hernandifolia, *Wall.*; *H. f. & T. Flor. Ind.* i. 196. cum Syn.

Hab. In Clarence Peak, alt. 3–5000 ped. (fl. Dec.)

Identical with the Indian plant, which is also a native of various parts of Tropical and Southern Africa, Java, and Australia.

Violarieæ.

1. Viola Abyssinica, *Steud.*, var. *impunctata*.

Hab. In Clarence Peak, alt. 10,000 ped. (fl. April.)

Caules repentes, elongati, hic illic radicantes. *Folia* impunctata. *Flores* pallide purpurei.

Except in wanting the oblong brown maculæ on the foliage, I can find no distinction whatever between this and the plant of Abyssinia, where as at Fernando Po, it grows in the region of heaths. It is also found in Madagascar with unspotted foliage.

Pittosporeæ.

1. Pittosporum Mannii, *H. f.* Foliis elliptico-lanceolatis utrinque attenuato-acuminatis margine undulatis, paniculis ramosis multifloris puberulis, floribus parvis, capsula parva latissime obovoidea.

Hab. In Clarence Peak, alt. 8500 ped. (fl. Dec.)

Frutex 20-pedalis. *Folia* petiolata, glaberrima, $2\frac{1}{2}''$–$3\frac{1}{2}''$ long., utrinque viridia, glaberrima. *Panicula* subpyramidalis, $1\frac{1}{2}''$ long., erecta, ramis erecto-patentibus. *Flores* $\frac{1}{5}''$ long., flavi; sepalis basi connatis, acutis, glabriusculis petalis obtusis dimid. brevioribus; ovario staminibusque glaberrimis. *Capsula* (unica tantum visa) $\frac{1}{4}''$ long., $\frac{1}{3}''$ lata, basi abrupte angustata, apice retusa.

Allied to *P. Abyssinicum*, Hochst., which has generally obtuse leaves; and more closely still to the Mauritius *P. Senacia*, Putt., but differing from both in the erect paniculate inflorescence, smaller flowers and very different capsule.

Caryophylleæ.

1. Sagina Abyssinica, *Hochst.*; *Rich. Fl. Abyss.* i. 47.

Hab. In Clarence Peak, alt.? (fl. Dec.)

This is absolutely identical with the Abyssinian plant, and is a very distinct species from any other. The flowers are often tetramerous. The only other Fernando Po plant of this order is *Drymaria cordata*, W., which grows at low levels.

Hypericineæ.

1. Hypericum angustifolium, *Lamk.*; *DC. Prodr.* i. 545.

H. leucoptychodes, *Steud.*; *Rich. Fl. Abyss.* i. 96.

Hab. In Clarence Peak, 7–10,000 ped. copiosissime. (fl. Dec.)

Arbuscula 30-pedalis. *Folia* interdum et sepala secus marginem punctata, sæpius omnia impunctata.

The Bourbon specimens of this noble plant have the leaves rather narrower than the Abyssinian, and wholly impunctate. In both the Fernando Po and Abyssinian specimens, the calyx and leaves have sometimes the margins punctate. The leaves of the Fernando plant are in some specimens like the Abyssinian, in others like the Bourbon. It is a very common tree in the mountains of Abyssinia.

Geraniaceæ.

1. Geranium Simense, *Hochst.*; *Rich. Fl. Abyss.* i. 116.

G. Emirnense, *Hils. & Bojer*, MSS. in *Hb. Hook.*

Hab. In Clarence Peak, alt. 8500 ped. (fl. Ap.–Dec.)

Mr. Mann's specimens are identical with Bojer's Madagascar *G. Emirnense*, and with some of Schimper's Abyssinian *G. Simense*, which A. Richard describes as a very variable plant, and common in the cold regions of Abyssinia.

Balsamineæ.

This order is probably common in the hilly regions of Tropical Africa, whence I have seen about a dozen species. Only one, however, is described as Abyssinian, and one South African. I shall here describe four Fernando Po species, of which only one ascends to 5000 feet, and none have been found above that elevation. I have referred these to the sections adopted in the monograph of the East Indian species, published in the fourth volume of this Journal. They are as follows:—

1. Umbellatæ. Folia alterna. Flores ad apicem pedunculi elongati congesti v. dense racemosi.
2. Unifloræ. Folia alterna. Pedicelli in axillis foliorum solitarii v. fasciculati, uniflori.
3. Laterifloræ. Folia alterna. Flores racemosi, racemi foliis breviores v. axillis foliorum inferiorum dispositi.

1. Impatiens (Umbellatæ) filicornu, *H.f.* Foliis longe petiolatis,

late ovatis acutis setoso-crenatis, pedunculis elongatis gracillimis, apice floriferis, bracteis imbricatis cymbiformibus caducis, sepalis lateralibus obtusis, vexillo erecto late oblongo, labello planiusculo, calcare strictiusculo gracillimo alis æquilongo instructo.

Hab. In Clarence Peak, alt. 5000 ped. (fl. Dec.)

Herba tota glaberrima, pedalis; caule gracili simplici. *Folia* alterna, sub 2″ long., petiolis æquilonga, membranacea. *Pedunculi* laterales folia superantes, gracillimi, apices tantum floriferi, et ibi bracteis delapsis cicatricati. *Bracteæ*, $\frac{1}{3}$″ long., obtusæ. *Pedicelli* gracillimi, $\frac{3}{4}$″ long., erecti. *Flos* pallide purpureus, 1″ diamet. planus. *Alæ* bilobæ, lobo laterali brevi obtuso, terminali oblongo obtuso.

This has very much the habit of the Ceylon *I. subcordata*, Arn.

2. Impatiens (Unifloræ) Mannii, *H. f.* Caule gracili basi repente, foliis subdistantibus gracile petiolatis, petiolo glanduloso, ovatis acuminatis basi attenuatis setuloso-crenatis, pedicellis 1–2-axillaribus gracilibus ebracteolatis 1-floris, sepalis lateralibus parvis, vexillo mediocri, labello late conico calcare gracili curvo, alis longe gracile petiolulatis, lobo laterali unciformi parvo, terminali lato.

Hab. In Fernando Po, alt. 4000 ped. (fl. Dec.)

Herba 2–3′-pedalis, glaberrima, gracilis. *Folia* 2–3″, petiolo, $\frac{1}{2}$″–1′, glandulis gracilibus ornato. *Pedicelli* graciles, petiolis breviores, fructiferi deflexi. *Flores* pulcherrimi, "rubidi" (*Mann*), sicco violacei, labello transverse fasciato. *Alæ* cum ungue gracili fere 1″ longæ.

3. Impatiens (Unifloræ) bicolor, *H. f.* Suffruticosa, foliis confertis petiolatis elliptico-lanceolatis obtusis v. acuminatis basi attenuatis grosse setuloso-crenatis, pedicellis unifloris in axillis foliorum solitariis v. confertis ebracteolatis, vexillo parvo erecto, labello amplo late saccato basi in cornu valido ascendente incurvato contracto, alis parvis late oblongis obtusis.

Hab. In Fernando Po, alt. 4000 ped. (fl. Dec.)

Herba 2–3-pedalis, caule basi lignoso robusto, nodoso, superne cicatricato. *Folia* versus apices caulis conferta, patentia, 4–6″ long. in petiolum 1″ long. angustata, subcarnosula. *Flores* conferti, perplurimi (v. rarius pauci), bicolores, pedicellis 1″ long., sæpissime liberis, interdum in pedicellum brevem fasciculatis. *Sepala lateralia* parva, viridia. *Vexillum* flavo-virens $\frac{4}{3}$″ long., erectum. *Labellum* purpureum. *Alæ* longitudine oris labelli, flavæ purpureo lineatæ.

4. Impatiens (Lateriflorae) hians, *H. f.* Foliis alternis longe petiolatis ovatis acuminatis basi rotundatis longe setosis setuloso-crenatis, racemis ex axillis inferioribus ortis, bracteis ovato-lanceolatis persistentibus, floribus magnis hiantibus, vexillo amplo erecto orbiculato dorso alato, labello demisso longe crasse conico stricto ore valde obliquo, alis linearibus.

Hab. In Fernando Po, alt. 2000 ped. (fl. Dec.)

Herba gracilis, erecta, glabra, 2½-pedalis, caule simplici basi radicante.

Folia membranacea, glaberrima v. superne sparse pilosa, $2\frac{1}{2}''$–$4''$ long., basin versus utrinque setis $\frac{1}{2}''$–$\frac{1}{4}''$ longis filiformibus 1–2 ornata; petiolo 1″ long. *Pedunculi* foliis breviores, patentes, 2–6-flori. *Flores* gracile pedicellati, rubri, bilabiati. *Sepala lateralia* viridia, $\frac{1}{4}''$ long. *Vexillum* $\frac{3}{4}''$ lat., dorso late alatum. *Labellum* $1\frac{1}{2}''$ long. *Alæ* ore labelli subæquantes, v. paulo superantes. *Capsula* linearis.

There is another species of *Impatiens* in the Herbarium, but in too imperfect a state for description.

Nat. Ord. Oxalideæ.

1. Oxalis corniculata, *L.*

Hab. In Clarence Peak, alt. 8500 ped.

Nat. Ord. Ochnaceæ.

1. Gomphia micrantha, *H.f.* Glaberrima, foliis lanceolatis acuminatis serrulatis utrinque nitidis venis remotis arcuatis, racemis terminalibus elongatis paucifloris vix ramosis folio brevioribus, floribus minutis remote fasciculatis glaberrimis.

Hab. In Clarence Peak, alt. 5000 ped. (fl. Nov.)

Frutex 15-pedalis. *Rami* graciles, virgati, teretiusculi. *Folia* breve petiolata, 4–6″ long., membranacea, utrinque concolora. *Racemi* gracillimi, pauciflori. *Flores* breviter pedicellati, 1‴ longi. *Calyx* brunneus, foliolis oblongis. *Petala* rufa.

Leguminosæ.

The three plants of this family which have been found above 5000 feet, are all essentially temperate forms—one *Cytisus*, typical of the Mediterranean region and Canary Islands, but hitherto unknown in Tropical Africa, and known by one species only in Abyssinia: the others belong to *Trifolium*, also a Mediterranean genus, but several species of which are Abyssinian, including both the Fernando Po ones.

1. Cytisus Mannii, *H.f.* Sericeo-pilosa, ramulis divaricatis villosis, foliis parvis brevissime petiolatis stipulis subulatis, foliolis ellipticolanceolatis involutis, floribus ad apices ramulorum confertis sessilibus, calycis labio superiore late bifido.

Hab. In Clarence Peak, alt. 9000 ped. (fl. Dec.)

Frutex 5–6-pedalis, ramis lignosis, ramulisque divaricatis teretiusculis. *Folia* solitaria et fasciculata, $\frac{1}{4}''$ long., stipulis subulato-lanceolatis petiolo adnatis, foliolis acutis $1\frac{1}{2}'''$ long. *Flores* flavi, $\frac{1}{3}''$ expans. *Calyx* bilabiatus, sericeus, labio superiore late bifido lobis acuminatis, inferiore apice trifido, lobis subulatis. *Vexillum* orbiculatum dorso sericeum. *Alæ* carinam obtusam genitalia includentem æquantes. *Staminum* tubus integer. *Ovarium* hirsutulum; stylo gracili mediocri; stigmate fere terminali; ovulis paucis.

2. Trifolium subrotundum, *Steud. & Hochst.*; *A. Rich. Flor. Abyss.* i. 172. *Var.* stipulis majoribus.

Hab. In Clarence Peak, alt. 9000 ped. (fl. Dec.)

Herba diffusa, 1–2-pedalis, corolla rubra.

A common Abyssinian plant, cultivated as horse-forage according to Dr. Roth (Herb. Hook.). The Fernando Po specimens differ in having larger stipules ($\frac{3}{4}''$ long.) than the Abyssinian, in which, however, they are very large for the genus (nearly $\frac{1}{2}''$): in habit, foliage, inflorescence and flowers they are identical.

3. Trifolium Simense, *Fresen*; *A. Rich.*, l. c. 171.

Hab. In Clarence Peak, alt. 8500 ped. (fl. Dec.)

Herba $1\frac{1}{2}'$ alt., corolla violacea.

Very similar, as A. Richard indicates, to *T. subrotundum*, but well distinguished by the calyx, very narrow leaflets, and short petioles. The stipules terminate in a long filiform appendage, both in the Fernando Po and Abyssinian specimens.

Rosaceæ.

1. Rubus apetalus, *Poir.* *Var.* glabrior petalis parvis instructa.

Hab. In Clarence Peak, alt. 7000 ped. (fl. Nov.)

Scandens 12–15-pedalis. *Petala* alba, valde caduca.

This is clearly a form of *R. apetalus* of Bourbon, of which I have examined a Bourbon specimen gathered by Carmichael. Another form of it, sometimes bearing petals, and otherwise differing in having glabrous carpels, is found in Madagascar. A third, always petaliferous, is the *R. exsuccus*, Steud., of Abyssinia, which is described by A. Richard (Fl. Abyss. i. 256) as having the fruit entirely dry, but of which Dr. Roth remarks, "Berries eatable" (MS. in Hb. Hook.). Dr. Kirke, who has gathered the latter species in the Shirà Mountains (Livingstone's Exped., 1860), says, "Fruit good, exactly like the bramble, but small." The Fernando Po specimens are are not in fruit. This species has not been found in South Africa.

Umbelliferæ.

1. Sanicula Europæa, *L.*

Hab. In Fernando Po, alt. 4000 ped. (fl. Nov.)

I should suspect some error in the low elevation assigned by Mr. Mann to this plant, were his specimens not so carefully ticketed in other cases that I have every reason to put confidence in this. A. Richard gives *S. Europæa*, var. *Capensis*, as a native of Abyssinia; he does not, however, say what the characters of that variety are, and adds that his specimens are identical with Parisian. This plant has a very wide range in the mountainous regions of both Americas and Asia, and is also found in South Africa.

2. Agrocharis gracilis, *H. f.* Caule elongato ramoso foliisque hispidulo-pilosis, foliis gracile petiolatis bipinnatisectis segmentis lanceolatis acutis incisis, pedunculis elongatis sub apices patentim hispidis pilis flexuosis, floribus dense congestis.

Hab. In Clarence Peak, alt. 7000 ped. (fl. Dec.)

Herba gracilis, 4-pedalis, *A. melananthæ* (Abyssiniæ) quam maxime affinis, differt caule gracili elongato ramoso, foliis magis pilosis, capi-

tulis minoribus densius congestis, pedunculisque apices versus patentius pilosis pilis laxioribus flexuosis.

It is with some hesitation that I venture to describe this plant as different from the Abyssinian, fearing the characters depend wholly on locality. This curious genus is allied to *Daucus*, and the Abyssinian is the only previously described species.

3. Gymnosciadium??

Hab. In cacumine Clarence Peak, alt. 10,000 ped.

Herba pilosa, radice valida insapida, caulibus 4–6″ longis; foliis pinnatis, pinnis paucijugis crenatis rhombeo-rotundatis reniformi-rotundatisve terminali cordato. *Umbellæ* compositæ. *Involucrum* generale nullum, partiale foliolis paucis. *Calycis* margo integer. *Petala* inflexa. *Styli* breviusculi.

This may belong to the Abyssinian genus to which I have doubtfully referred it; but not being in fruit, nothing can be made of it.

4. Genus?

Hab. In Clarence Peak, alt. 9500 ped. (fl. Dec.)

Herba glabra, elata, 2–3-pedalis; radice insapida; caule tereti striato; foliis radicalibus tripinnatis, foliolis ovato-lanceolatis, lobatis, pinnatifidisve, segmentis acutis. *Umbella* composita. *Involucrum* universale et partiale foliolis paucis linearibus. *Calycis* limbus 5-lobus, lobis acutis. *Petala* inflexa. *Styli* mediocres recurvi. *Mericarpia* immatura anguste oblonga, late alata, dorso 5-juga.

This is a very ordinary form of *Umbellifera*, presenting no striking character.

Araliaceæ.

Paratropia Mannii, *H. f.* Glaberrima, foliis 4–9 foliolatis, petiolis petiolulisque gracilibus, foliolis ovato- v. oblongo-lanceolatis longe acuminatis integerrimis superne lucidis venis inconspicuis, marginibus subundulatis, floribus in capitulos arcte connatis, capitulis secus ramos simplices elongatos racemosis longe pedunculatis.

Hab. In Ins. Fernando Po, alt. 5000 ped, (fl. Dec.)

Arbor 40-pedalis, caule crasso. *Folia* stipulata, stipulis 1″ dorso supra medium petiolo adnatis ovato-lanceolatis subspathaceis; petiolo 6–8″, tereti; petiolulis 1½″ apice subarticulatis; foliolis 4–7″ coriaceis, inferne opacis. *Inflorescentia* ut videtur terminalis, ramis floriferis in ramulo apice crasso confertis, 1′ et ultra, strictis, erectis, v. erecto-patentibus, basi bracteatis; bracteis stipulis similibus. *Capitula* diam. pisi, globosi, sub-20-flori, secus pedunculos floriferos racemosi, pedunculis crassis 1″ long. post anthesim sæpe decurvis. *Flores* sub $\frac{1}{6}$″ expans., flavi, hermaphroditi? bracteolis late ovatis pubescentibus ovario brevioribus suffulti. *Ovarium* late obconicum, 5-loculare, obscure angulatum. *Calycis* limbus truncatus, integer, brevis, liber. *Petala* ovata apice inflexa. *Filamenta* subulata petala æquantia; antheris breviter oblongis flavis. *Stigmata* punctiformia, disco late conico vix elevato.

A very handsome plant, of which Mr. Mann has collected excellent specimens.

RUBIACEÆ.

1. Galium Aparine, *L.* *Var.* hamatum.

G. hamatum, *Hochst.*; *A. Rich. Flor. Abyss.* i. 345.

Hab. In Clarence Peak, alt. 6–8000 ped. (fl. Dec.) Flores flavi.

I find it impossible to distinguish this from *G. Aparine*, L. A. Richard remarks of the Abyssinian specimens of *hamatum*, that the hooks of the leaves are stronger and more marked than in any other of the genus; but I do not find them to be so in his or this plant, though more strong than in many European specimens of *G. Aparine*. Mr. Mann describes the flowers as yellow, A. Richard as *apparently* purple. It is also a native of South Africa and many other parts of the world.

2. Galium rotundifolium, *L.* *Var.* foliis acutioribus.

Hab. In cacumine Clarence Peak, alt. 10,000 ped. (fl. Dec.)

All the leaves of the Fernando Po specimens are acute, or rather mucronate; some of those of the Abyssinian specimens are so too, whereas in the European and Indian forms they are more or less obtuse: still all the other characters appearing identical with those of the European, I cannot separate this on the grounds of one which is variable. Mann describes the flowers as yellow; in the dried specimens they appear white.

3. ANTHOSPERMUM ASPERULOIDES, *H.f.* Parvulum, caule flexuoso teretiusculo hirtello, foliis parvis fasciculatis lanceolatis subsessilibus, stipulis utrinque rigide subulatis marginibus recurvis parce hispidulis, floribus parvis tetrameris, coccis oblongis lævibus glaberrimis.

Hab. In cacumine Clarence Peak, alt. 10,000 ped. (fl. Dec.)

Herba parvula, 8″ alt., parce ramosa, foliosa. *Caules* teretiusculi. *Folia* densa, patula, $\frac{1}{4}$″ long.

Allied both to Cape and Abyssinian species, but distinct from any known to me by the small size, flexuose habit, and erect subulate limb to the sheathing stipules.

COMPOSITÆ.

1. VERNONIA CLARENCEANA, *H.f.* Erecta, herbacea, gracilis, subhispido-pilosa; caule parce diviso subflexuoso, foliis linearibus linearilanceolatisve sessilibus semi-amplexicaulibus remote serrato-dentatis acuminatis, capitulis multifloris ad apicem caulis congestis breve pedunculatis, pedunculis tomentosis, involucri late campanulati squamis rigidiusculis lineari-lanceolatis acuminatis purpureis, dorso pilosis subherbaceis.

Hab. In Clarence Peak, alt. 8500 ped. (fl. Dec.)

Herba rigidiuscula, 1–2-pedalis. *Caulis* purpureus, laxe foliatus, superne subvillosus. *Folia* 2–3′ long., suberecta, paulo recurva, $\frac{1}{3}$″–$\frac{3}{4}$″ lat., inferiora in petiolum subangustata, superiora basi latiora, rigide membranacea, utrinque subhispido-pilosula, nervis paucis prominulis. *Capitula* 10–15 ad apices ramulorum, $\frac{1}{3}$″ long. et lat. non bracteata.

Involucri squamæ sub 2-seriales, enerves, margine scariosæ. *Receptaculum* planum, foveolatum, nudum. *Flores* numerosissimi, perplurimi fœminei; tubus corollæ gracilis, pappo et stylo gracili dimidio brevior. *Pappus* albus, nitidus, 1-serialis, pilis filiformibus flexuosis scaberulis. *Achænium* parvum, pallidum, glaberrimum, valde compressum, oblique obovoideum, margine subincrassato. Fl. masc. pauci, 5-dentati.

This belongs to the section with *V. attenuata*, DC., and is most nearly allied to an Abyssinian one called *V. inulæfolia*, Steud.

2. Adenostemma viscosum, *Forst.*

Hab. In Fernando Po, alt. 4–8000 ped. (fl. Dec.)

Herba 3–4-pedalis, corollis albis.

I believe that there is but one species of this genus in the Old World; it is a native of Abyssinia (*A. Schimperi*, C. H. Schultz), of South Africa, of all Tropical Asia and the Pacific Islands. The Fernando Po form is the common Indian one.

3. Dichrocephala oblonga, *H.f.* Hispidulo-pilosa, caule tereti apice ramoso, foliis sessilibus patulis lineari- v. oblongo-lanceolatis acuminatis irregulariter pinnatifido-lobatis marginibus recurvis lobis subremotis incisis lobulis acutis v. mucronatis, capitulis late oblongis purpureis, involucri squamis 6–8 herbaceis pubescentibus, receptaculo columnari.

Hab. In cacumine Clarence Peak, alt. 10,700 ped. (fl. Dec.)

Herba erecta, rigidula, 1–2-pedalis. *Folia* $1\frac{1}{2}''$–$2''$ long.; $\frac{1}{3}''$–$\frac{1}{2}''$ lat. *Capitula* $\frac{1}{4}''$ long.—*D. chrysanthemifoliæ*, DC. (Abyssinica, C. H. Schultz) proxima, differt habitu rigido, caule simplici, foliis angustioribus rigidis acutius lobatis, et præcipue capitulis oblongis, involucro oligophyllo et receptaculo columnari.

The nearest ally of this is *D. chrysanthemifolia*, a native of Abyssinia and India.

4. Helichrysum (Xerochlæna) Mannii, *H.f.* Caule robusto villoso apice ramoso; foliis densissimis sessilibus, patulis demum reflexis, semiamplexicaulibus oblongo-lanceolatis acutis integerrimis enerviis subtus marginibusque tomento appresso niveis, pedunculis basi capitulisque magnis albis v. pallide stramineis foliaceo-bracteatis, involucri squamis numerosissimis hyalinis splendentibus acuminatis.

Hab. In cacumine Clarence Peak, alt. 10,000 ped. (fl. Dec.)

Herba robusta, dense foliosa, pedalis et ultra, tomentosa. *Caulis* strictus erectus, teres, simplex, densissime foliatus. *Folia* $2''$–$3''$ long., $\frac{2}{3}''$-lata, acuta et apiculata, inferiora supra glabrata, inferne dense appresse lanata, superiora utrinque laxius lanata v. araneosa. *Capitula* subpaniculatim corymbosa, bracteis foliaceis fere tecta, expansa $1\frac{1}{4}'$ lata, pedunculis araneosis bracteolatis. *Involucri* squamæ perplurimæ, multiseriatæ, suberectæ, flosculis $\frac{1}{5}''$ excedentes, apicibus acuminatis vix recurvis, externæ araneosæ, ceteræ glaberrimæ, internæ minores et

angustiores late unguiculatæ, supra unguem purpureæ. *Receptaculum* convexiusculum, amplum, alveolatum. *Flosculi* numerosissimi. *Pappus* paucisetosus. *Corolla* anguste tubulosa. *Achænium* minimum glabriusculum.

A noble species, allied to *H. fœtidum*, but differing in the dense foliage, leaves less broad at the base, different form of inflorescence, which is more paniculate than corymbose, and much larger capitula.

5. Helichrysum (Xerochlæna) fœtidum, *Cass.*; *A. Rich. Flor. Abyss.* i. 426.

Hab. Ad Clarence Peak, alt. 10,000 ped. (fl. April.)

An extremely variable plant, native of Abyssinia, South Africa, Madagascar, and Mauritius, varying in breadth and tomentum of foliage, somewhat in size of the capitula, and much in their colour, from white to deep golden yellow.

6. Helichrysum (Chionostemma?) chrysocoma, *C. S. Schultz*; *A. Rich. Flor. Abyss.* i. 424. Var. *angustifolium*, gracile, foliis anguste lanceolatis acuminatis marginibus revolutis tomentosis v. superne glabratis; pappi setis albis.

Hab. Clarence Peak, alt. 10,000 ped. (fl. April.) *Herba* 4-pedalis.

I have examined several authentically named Abyssinian specimens of this plant, which present great variations in tomentum and breadth of foliage. The present differs from all in being rather more glabrous and slender, and smaller in foliage. The inflorescence, capitula, involucres, and florets are identical in all. The receptacle in all is covered with conical subulate elongate dark-yellow rigid bodies, that are persistent after the florets have fallen away. They are not noticed in A. Richard's work; these would refer this species to DeCandolle's section *Chionostemma*, were it not that the setæ of the pappus are quite free at the base. Richard describes the pappus as ferruginous, but it is white in all the Abyssinian specimens I have examined of Schimper's, and in the Fernando Po ones also.

7. Helichrysum (Achyrocline) Hochstetteri, *C. H. Schultz*; *A. Rich. Flor. Abyss.* i. 429.

Hab. Clarence Peak, alt. 8500 ped. (fl. Jan.) *Herba* 2-3-pedalis.

Mr. Mann's specimens are not a full flower, but the small size, great number and form of the capitula, the involucral scales, habit, tomentum, foliage and winged stems, leave no room to doubt that the present is identical with the Abyssinian plant, of which I have compared many specimens. The bruised capitula of the Abyssinian plant are aromatic, a character I do not observe in the Fernando Po, which are probably either too young, or, owing to the damp climate, deficient in aroma.

8. Helichrysum (Chionostemma?) globosum, *C. H. Schultz*; *A. Rich. Flor. Abyss.* i. 425.

Hab. Clarence Peak, alt. 10,000 ped.

Apparently identical with the Abyssinian plant.

9. Gynura vitellina, *Benth. in Niger Flora*, 438.

Hab. Fernando Po, ad 8500 ped. in Clarence Peak attingens. (fl. Dec.)

First found in Fernando Po by Vogel, afterwards by Barter on the same island, and in Abyssinia by Dr. Roth. It is an instance of a mountain plant descending to the level of the sea at the base of the mountains, but not found elsewhere at the same level, on the African coast.

10. Senecio (Obæjacæ) Clarenceana, *H.f.* Herbacea, erecta, glaberrima, caule folioso, foliis amplis patulis sessilibus lineari-oblongis, v. oblongo-lanceolatis obtusis basi auriculatis marginibus semipinnatifidis, lobis grosse dentatis, capitulis ($\frac{1}{2}$″ long.) corymbosis obconico-campanulatis gracile pedicellatis multifloris, involucri vix calyculati foliolis linearibus pedicellisque puberulis, flosculis omnibus tubulosis (sub 30–40), achæniis glabris.

Hab. Clarence Peak, alt. 9000 ped. (fl. Dec.)

Herba 2-pedalis, robusta, glabra nisi pedunculis pedicellis involucrisque puberulis. *Caulis* erectus, simplex. *Folia* 3″–5″ long., 1″ lat., subcarnosula, subtus pallidiora. *Corymbi* multiflori.

11. Senecio (Arborescentes) Mannii, *H.f.* Glaberrima, ramis apice foliatis teretibus cicatricatis, foliis breve petiolatis lanceolatis longe acuminatis dentatis costa nervisque subtus creberrimis pilosulis, paniculis terminalibus ramosis multifloris, ramis pedunculis pedicellisque gracilibus pubescentibus capitulis ($\frac{1}{3}$″ long.) angustis paucifloris, involucri squamis paucis erectis apice incurvis anguste linearibus basi bracteolatis.

Hab. Fernando Po, alt. 6000 ped. (fl. April.)

Arbor parva, 25′ alt., ramis crassiusculis. *Folia* spithamæa et ultra 1$\frac{1}{2}$″ lat., petiolo vix 1″ long., membranacea, utrinque concolora, juniora parce ferrugineo-tomentella, nervis crebris subhorizontalibus. *Panicula* longiuscule pedunculata, 6″ alt., ramis subelongatis. *Involucri* squamæ (sub 5) angustæ, medio herbaceæ, acute carinatæ, marginibus late hyalinis, apicibus incrassatis. *Flosculi* sub 6, achæniis glabris.

A handsome species, resembling some of the Indian mountain forms.

Lobeliaceæ & Campanulaceæ.

1. Lobelia (Tupa) columnaris, *H.f.* Tota pubescenti-tomentosa foliis confertis sessilibus anguste lanceolato-oblongis acutis irregulariter denticulatis subtus dense tomentosis, racemo elongato conico densifloro, floribus dense pubescentibus.

Hab. Clarence Peak. (fl. Dec.)

Herba robusta, ut videtur 3-4-pedalis, dense foliosa. *Caulis* crassus, simplex, diam. digiti majoris. *Folia* 4″–6″ long., $\frac{3}{4}$″–1″ lat., erecto-patentia, nervis crebre reticulata. *Racemus* 8″–12″ long. *Flores* densissime imbricati, 1$\frac{1}{3}$″ long., angusti; alabastris cylindraceis, lente curvis. *Bracteæ* inferiores foliaceæ, flores subæquantes, superiores

breviores. *Pedicelli* inferiores 1″ long. *Calycis* tubus hemisphæricus, lobis anguste lanceolato-subulatis, integerrimis, corollam triente brevioribus. *Corolla* lobis anguste ligulatis tubum æquantibus. *Staminum* tubus fere rectus, pubescens; antheris pilosis vix barbatis.

Closely allied to *Lobelia nicotianæfolia* of India. There are two Abyssinian allies, but no described South African, Mauritian or Madagascar.

2. Wahlenbergia polyclada, *H. f.* Hispido-pilosa, superne glabra, caulibus e collo numerosissimis basi decumbentibus demum erectis apice dichotome ramosis floriferis, foliis (parvis) sessilibus oblongo- v. ovato-lanceolatis acutis integerrimis undulatis, floribus parvis, calyce longe obconico, corolla brevissima capsula biloculari.

Hab. Clarence Peak, ad declivum orientem alt. 9000 ped. (fl. Dec.)

Herba radice gracili. *Caules* spithamæi ad pedalem, inferne et folia pilis hispidulis subcrispatis laxiuscule vestiti, superne divisi, glaberrimi gracillimi. *Folia* $\frac{1}{4}''$–$\frac{1}{2}''$ long., basi obtusa v. subcordata, margine lente recurva. *Flores* $\frac{1}{3}''$ long.; calycis tubus anguste obconicus, lobis breviusculis, triangulari-lanceolatis. *Corolla* parva, cærulea, *calycis* lobos vix superans, an perfecta?

Not unlike *W. gracilis*, a very widely diffused Australian, Indian, &c. species, and of the same habit.

3. Wahlenbergia arguta, *H. f.* Glabra, caulibus gracillimis elongatis ascendentibus, apice pedunculos elongatos dichotome ramosos gerentibus, foliis sessilibus lanceolatis acuminatis argute serratis, floribus mediocribus, calyce brevissime obconico, corolla campanulata, capsula semisupera 3-loculari.

Hab. In Clarence Peak, alt. 8500 ped. (fl. Dec.)

Herba gracillima, caulibus flexuosis pedalibus parce vage ramosis. *Folia* $\frac{1}{2}''$–$\frac{3}{4}''$ long., basi angustata, marginibus tenuiter recurvis. *Pedunculi* 3–4-pollicares, superne dichotome divisi, ad axillas bracteati, bracteis subulatis. *Flores* $\frac{1}{3}''$–$\frac{1}{2}''$ longi, suberecti. *Calycis* tubus brevissimus, lobis triangulari-lanceolatis, corolla pallide cærulea multoties breviori-bus. *Capsula* trapezoidea semisupera.

The habit of this species is that of the St. Helena *W. angustifolia*, ADC, to which it is nearly allied, though the capsula is 3-celled.

Ericeæ.

1. Leucothoe angustifolia, var. β. pyrifolia, *DC. Prodr.* i. 603.

Hab. In Clarence Peak, alt. 8500 ped. (fl. Dec.)

Arbor 15–20-pedalis, corolla rufo-ferruginea.

Apparently identical with the plant of Mauritius and Bourbon; it also inhabits Madagascar. The flower and fruit vary a good deal in size.

2. Blæria spicata, *Hochst.*; *A. Rich. Flor. Abyss.* ii. 13.

Hab. In cacumine Clarence Peak, alt. 10,700 ped. (fl. Dec.)

Fruticulus pedalis.

This is identical with the Abyssinian plant. The genus was previously supposed to be confined to South Africa and Abyssinia.

3. Ericinella Mannii, *H. f.* Ramulis puberulis, foliis appressis glabris nitidis, pedicellis folia superantibus, sepalis superioribus corolla dimidio brevioribus, antheris muticis inclusis, stylo breviter exserto.

Hab. Clarence Peak, alt. 10,000 ped. (fl. Dec.)

Frutex 10-pedalis.

Extremely closely allied to the South African *E. multiflora*, Kl., and Madagascar *E. gracilis*, Benth., and almost intermediate between these, though quite distinct from both. It differs from *gracilis* in the pubescence, white stems and branches, longer pedicels and shorter sepals; from *E. multiflora* in the longer pedicels, erect leaves, muticous anthers and short style.

Loganiaceæ.

1. Anthocleista scandens, *H. f.* Caule tetragono, foliis petiolatis obovatis apiculatis, petiolis non alatis basi exauriculatis, corolla 12-mera, antheris fauce corollæ sessilibus.

Hab. Clarence Peak, alt. 5000 ped. (fl. Dec.)

Arbor scandens, 50-pedalis. *Ramuli* non spinosi. *Folia* 3″–4″ long., petiolo pollicari. *Calyx* fere 1″ long. *Corolla* 2″ expans. *Bacca* obovoidea, 2-pollicaris.

A very distinct species from *A. Vogelii* or *nobilis*, with flowers twice as large, leaves not half as large, sessile anthers, and a much larger berry.

Gentianeæ.

1. Sebæa brachyphylla, *Griseb.*; *DC. Prodr.* ix. 53.

Hab. Clarence Peak, 8500—10,000 ped. (fl. Dec.)

Herba 1–1½-pedalis, floribus flavis.

Appears identical with the Madagascar plant.

2. Swertia Clarenceana, *H. f.* Glaberrima, caule erecto anguste alato, foliis cordato-subrotundis obtusis margine recurvis, sepalis oblongis obtusis corolla dimidio brevioribus, corollæ lobis obovato-oblongis obtusis, staminibus 5, foveæ nectariferæ marginibus fimbriatis.

Hab. Ad cacumen ipsum Clarence Peak, alt. 10,700 ped. Exempl. solitarium. (fl. Dec.)

Herba 6″ alt. subrobusta, caulis alæ angustæ, interdum margine subglanduloso-denticulata. *Folia* ⅓″ long. *Flores* laxe cymosi, pro planta majusculi, fere ¾″ expans.

Very nearly allied to *S. Abyssinica*, but differs in more stout habit and much larger flowers.

Myrsineæ.

1. Mæsa Indica, *ADC.*; *Prodr.* viii. 80.

Hab. Fernando Po, alt. 5000 ped. (fl. Nov.)

Arbor parva, 15–20-pedalis.

This does not differ from the Indian plant, which is found from the Himalaya to Australia. It is also very similar to a Natal and East African

species, with ciliated panicles. The *M. lanceolata* of Abyssinia differs more in texture and size than any floral characters.

Labiatæ.

1. Plectranthus (Coleoides) glandulosus, *H.f.* Herbaceus superne glanduloso-pilosus, foliis petiolatis ovato-cordatis acutis grosse crenatis crenis crenulatis membranaceis, racemis laxe paniculatis, paniculæ ramis patentibus pauciflоris, pedicellis gracilibus, corollæ defractæ labio inferiore porrecto saccato.

Hab. In Clarence Peak, alt. 7000 ped. (fl. April.)

Herba diffuse ramosa, 8-pedalis. *Rami* graciles, obtuse tetragoni, superne cum petiolis et inflorescentia glandulosi. *Folia* patentia longe petiolata, 3″-5″ long., 2″–4″ lat., supra glabra, subtus ad nervos pilosula, petiolis 2″–3″ long. *Panicula* ampla, laxa, divaricatim ramosa. *Verticillastra* pauciflora, floribus gracile pedicellatis in pedunculo communi gracili ternis. *Calyx* breviusculus, labio superiore brevi 1-lobo recurvo, inferiore longiore 4-fido lobis subulatis. *Corolla* cærulea, fere $\frac{2}{3}$″ long., labio superiore reflexo, inferiore cymbiformi obtuso.

This has near allies both in South Africa, Abyssinia, Madagascar, and India: it differs from the technical character of the *Coleoideæ* in the pedicelled flowers.

2. Plectranthus (Indi) ramosissimus, *H. f.* Pubescente-pilosa v. tomentosa, caule herbaceo erecto, ramis divaricatis, foliis petiolatis ovato-lanceolatis acutis crenatis utrinque pubescenti-pilosis, floralibus similibus sessilibus, cymis evolutis secus ramulos floriferos seriatim dispositis, pedunculis gracilibus apice ramosis 10–12-floris, calycibus villosis canis parvis, corollæ tubo pubescente recto.

Hab. In Fernando Po, alt. 5000 ped. (fl. Dec.)

Herba 6-pedalis, gracilis, divaricatim ramosissima, caulibus ramisque pilis subferrugineis sæpe deflexis vestitis. *Folia* $1\frac{1}{2}$″–2″ longa. *Rami* floriferi 6″–10″ long. *Cymæ* pedunculi patentes, graciles, $\frac{1}{2}$″–$\frac{3}{4}$″ long., apice bracteas 2 patentes subulatas gerentes. *Flores* parvi, $\frac{1}{4}$″ long. *Calycis* tubus canus, basi hemisphæricus, ore obliquo contracto. *Corolla* calyce ter longior, alba, recta v. lente curva, lobis subæqualibus recurvis, genitalibus longe exsertis.

All the other African plants of this section (Cape, Madagascar and Abyssinia) belong to a group in which the cymes are crowded and nearly sessile, with the corolla tube defracted. The present is much more closely allied to several mountain Indian species.

3. Pycnostachys Abyssinica, *Fresen. Flora*, 1838, ii. 608.

Hab. Fernando Po, alt. 700 ped. (fl. Dec.)

Herba 8-pedalis, corolla violacea.

Judging from the short description of Fresenius in the 'Flora,' this is

certainly his plant. It differs from its very near ally *P. cærulea* of Abyssinia in the large flowers and calyx and dense pubescence; from the Cape *P. reticulata* in the petiolate and broader leaves.

4. Calamintha Simensis, *Benth. in DC. Prodr.* xii. 230.
Hab. Clarence Peak. alt. 8500 ped. (fl. Dec.)
Herba 2-pedalis, corolla purpurea.
This in no way differs from Abyssinian specimens, and is very nearly allied to the European *C. Acinus*, Benth.

5. Stachys (Stachyotypus) aculeolata, *H.f.* Caule tenui procumbente elongato petiolisque retrorsum aculeolatis, foliis petiolatis ovato-cordatis obtusis grosse crenatis, verticillastris sessilibus sub 3-floris, floribus breve pedicellatis, calyce obconico subæqualiter 5-dentato lobis spinulosis, corolla tubo exserto, labio inferiore porrecto amplo trilobo lobo medio bilobo.
Hab. Clarence Peak, alt. 9000 ped. (fl. Dec.)
Herba parce ramosa, 1′–2′ longa. *Folia* distantia, 1″–1½″ longa, fere æquilata, petiolo pollicari. *Verticillastra* pauca, distantia, axillaria. *Flores* ½″ long., pallido purpurei tubo longe supra basin intus barbato, extus piloso. *Antheræ* divaricatæ.
This is the same with an undescribed Abyssinian species collected by Dr. Roth; but the stem is more slender, the petioles longer, the calyx rather smaller; I have no corolla in the Abyssinian specimen.

Solaneæ.

1. Solanum Indicum, *L.* Var. *micranthum*.
Hab. Fernando Po, alt. 6000 ped.
Frutex 6–8-pedalis, floribus albis.
Common throughout Tropical Africa, and probably not different from *S. Adoense* of Abyssinia.

Acanthaceæ.

1. Dicliptera maculata, *Nees.*? *A. Rich. Fl. Abyss.* ii. 158.
Var. Glanduloso-pilosa, floribus majoribus.
Hab. Fernando Po, alt. 5000 ped. (fl. Dec.)
Scandens 20-pedalis, corolla alba.
Apparently quite the same as the Abyssinian plant, but the flowers are either larger or owe their appearance of being so to better drying. In the Fernando specimens all parts are pilose and glandulose, in Abyssinian ones glabrous, but in A. Richard's character they are stated to be covered with cottony hairs. In the Fernando Po and one Abyssinian specimen the involucral leaves are quite obtuse and muticous, in another Abyssinian they are obscurely mucronate, and in a third ovate and pungent. Perhaps more than one species is included under this name.

Scrophularineæ.

1. Limosella aquatica, *L.* Var. *tenuifolia.*

Hab. Clarence Peak, alt. 9000–10,000 ped. locis humidis. (fl. Dec.,

This is an American, Australian, and South African form; the Abyssinian is the common European one, which also grows in South Africa.

2. Veronica (Veronicastrum) Mannii, *H.f.* Caule e basi decumbente erecto simpliciusculo bifariam pubescente foliato, foliis sessilibus oblongo-lanceolatis remotiuscule serrulatis acutis, racemo terminali conferto glanduloso-tomentoso, staminibus corolla brevioribus, capsula orbiculata emarginata.

Hab. Ad cacumen Clarence Peak, alt. 10,700 ped. (fl. Dec.)

Herba gracilis, pedalis. *Caule* tereti basi radicante. *Folia* $\frac{2}{3}$″ long., subcoriacea. *Racemus* brevis v. elongatus. *Flores* breve pedicellati, cærulei $\frac{1}{3}$″ expans. *Calycis* lobi oblongi, obtusi, capsulam æquantes.

Very nearly allied to *V. glandulosa*, Hochst., of Abyssinia, but, as far as the several excellent specimens of both show, quite distinct in the narrow leaves and sepals, and bracts shorter than the flowers. It may well, however, prove to be a variety of that plant.

Plantagineæ.

1. Plantago (Leptostachys) palmata, *H.f.* Rhizomate perenni horizontali, foliis longe petiolatis late cordato-orbiculatis palmatim 5–7 lobis, spica gracili, capsulis dispermis.

Hab. Clarence Peak, alt. 8000 ped. (fl. Dec.)

Glabra v. parce pilosa. *Rhizoma* crassum, fibras rigidas demittens, collo brevi. *Petioli* 4″–6″ longi, glabriusculi, apice dilatati. *Folia* 2″–3″ long. et lat., membranacea, nervis radiantibus. Scapi petiolis subbreviores. *Flores* inter minores, laxe imbricati, basi laxe barbati. *Bracteolæ* et sepala consimilia obtusæ oblongæ dorso medio herbaceæ late scarioso-marginatæ, glabræ v. parce pilosæ. *Corolla* parva, genitalibus longe exsertis. *Capsula* calycem paulo superans. *Semina* viridia, crassiuscula, cymbiformia.

A very remarkable species in the form of the leaf.

Santalaceæ.

1. Thesium (Euthesium) tenuissimum, *H.f.* Ramis e collo perplurimis ramulosis ramulisque gracillimis glaberrimis sulcatis, racemo ramoso, bracteolis 2 bracteam superantibus perianthio dimidio brevioribus ovato-subulatis, perianthii subcampanulati 4-5-fidi lobis inflexis exauriculatis, stylo stamina attingente, stigmate capitellato.

Hab. Ad Clarence Peak, alt. 9000 ped. (fl. Dec.)

Radix elongatus, teres, crass. pennæ corvinæ. *Rami* 4″–6″, gracillimi, angulati, squamulis minutis raris subulatis aucti. *Racemi* rami pauci breviusculi fasciculis sub 3-floris. *Bracteæ* et *bracteolæ* carinatæ ob-

scure ciliatæ. *Perianthium* $\frac{1}{8}''$ long. obscure et obtuse angulatum, lobis breviusculis glaberrimis v. margine obscure ciliatis. *Filamenta* ori inserta, antheris duplo longiora.

Very nearly allied indeed to *T. Madagascarense*, A. DC., which is the only other species of this vast genus in which the bracteolæ exceed the bracts, and the stems are almost leafless. It differs remarkably from that plant in size, in the very numerous very slender stems and branches, and much smaller flowers.

Thymeleæ.

1. Peddiea parviflora, *H.f.* Stamina ori perianthii inserta, ovarium apice villosum.

Hab. Fernando Po, alt. 5000 ped. (fl. Nov.)

Arbor 15–20-pedalis, floribus viridibus.—*P. Africanæ*, Harv., simillima, differt ramis gracilibus foliis magis membranaceis, floribus duplo minoribus, staminibus ori perianthii insertis, ovarioque apice toto villoso.

The only congener of this is a subtropical Port Natal tree.

Urticeæ.

1. Parietaria Mauritanica, *Wedd.*

Hab. Clarence Peak, alt. 8000 ped. (fl. Dec.)

Herba 6-8 pedalis.

The bracts are decidedly ovate, though narrower than usual in this form which seems to pass into *P. debilis*, Forst.; it is described by Weddell as a Mediterranean and North African species.

Euphorbiaceæ.

1. Euphorbia (Esula) ampla, *H.f.* Herbacea, glaberrima, foliosa; caule simplici superne patentim ramoso, foliis membranaceis petiolatis lanceolatis acutis subtus glaucescentibus, floralibus late ovato-cordatis v. triangulari-ovatis acuminatis, involucris solitariis laminis fimbriatis, glandulis semilinearibus cornubus brevibus.

Hab. In Clarence Peak, alt. 8500 ped. (fl. Dec.)

Herba 4-pedalis, caule crassiusculo, terete, inferne nudo. *Rami* patentes, conferti, spithamei et ultra, foliosi, terminalibus divaricatis. *Folia* 4″–5″ long., $\frac{3}{4}''$–1″ lat., integerrima, tenuiter nervosa, nervis divaricatis. *Involucra* sparsa, minima, solitaria. *Stamina* sub 8.

The habit of this species resembles *E. Lathyris*, but the whole plant is of a totally different texture; it is most near *E. monticola*, Hochst., of Abyssinia, but has not the involucral glands produced into subulate horns as in that plant. It is also allied to the Indian *E. Rothiana*; but in that the inflorescence is borne on peduncled special branches, and the involucres are numerous.

2. Claoxylon (Athroandra) Mannii, *H.f.* Glaberrimum, gemmis

perulatis, foliis alternis petiolatis lanceolatis acuminatis irregulariter sinuoso-serratis basi biglandulosis, fl. masc. laxe paniculatis, gracile pedicellatis, perianthio late campanulato 4–5 fido lobis triangularibus valvatis, antheris numerosissimis in globum supra receptaculum aggregatis, fl. fœm. perianthio 2-lobo, glandulis 2-lobis alternantibus, ovario 2-loculari, stigmatibus elongatis.

Hab. Fernando Po, alt. 5000 ped. (fl. Dec.)

Frutex 15-pedalis, ramis fragilibus teretibus. *Gemmæ* in axillis foliorum brevibus squamulis late obovatis rigide coriaceis pallidis nitidis tectæ. *Folia* spithamæa, membranacea, basi 3-nervia, petiolo pollicari. *Racemi* axillares et cum ramulis e gemmis orti, petiolis breviores v. æquilongi, pedunculo gracillimo, floribus paucis subcorymbosis gracile pedicellatis, pedicellis $\frac{1}{4}''$–$\frac{1}{3}''$ long. *Alabastra* late ovoidea. *Flores* virides, $\frac{1}{4}''$ diam. *Antheræ* numerosissimæ, sessiles, squamulis non immixtæ, loculis globosis. *Fl. fœm.* parvi, perianthii lobis parvis minutis oblongis. *Styli* recurvi, elongati.

A very singular plant, probably generically distinct from *Claoxylon*, from all other species of which the perulate buds abundantly distinguish it. A very similar species was found in the Niger by Barter.* The structure of the flower agrees with the character of *C. cordifolium*, Benth., but in that the anthers are sessile. The name of *Athroandra*, signifying crowded stamens, will serve to distinguish these species whether as genus or section.

Commelynaceæ.

1. Cyanotis Abyssinica, *A. Rich.*? *Flor. Abyss.* ii. 344.

Hab. Clarence Peak, alt. 9000 ped. (fl. Dec.)

A fine species, remarkable for its round tuberous roots, the size of a hazel nut. It may be the same with a Madagascar and South African species, but the extremely fugacious flowers are very difficult of analysis, and judging from dried specimens, I hardly think them the same.

Orchideæ.

[*By Dr. Lindley.*]

1. Calanthe, sp. nov.? C. Natalensi, *Reich.*, proxima.

Hab. In Clarence Peak, alt. 6000 ped.

Herba $1\frac{1}{2}''$ alt. Corolla alba et purpurea.

* *Claoxylon* (*Athroandra*) *Barteri*, H. f. Glabrum, gemmis perulatis, foliis ovato-lanceolatis abrupte acuminatis crenatis junioribus pilosis basi eglandulosis, fl. masc. parvis in pedunculum brevem gracilem sessilibus v. pedicellatis, perianthio 4-lobo, lobis valvatis, antheris ut in *C. Mannii*. *Fl. fœm.* stigmatibus parvis.

Hab. Flum. Niger ad Gomba, Eppah et Lagos,—beat. *Barter*. *C. Mannii* arcte affinis, differt foliis latioribus, parvis, 1″–2″ long. obsolete acuminatis basi non biglandulosis, floribus multoties minoribus et stylis brevibus.

2. Habenaria, sp. nov. H. peristyloides, *A. R.* (Abyssiniæ) et *H. præaltæ Thouars* affinis.

Hab. Ad cacumen Clarence Peak.

3. Polystachya?

Hab. Clarence Peak, alt. 6000 ped.

Epiphytica, species singularis et distinctissima. *P. capensi*, Sond., et *Ottonianæ*, Reichb, habitu similis.

4. Bolbophyllum, sp. nov.

Hab. Clarence Peak, alt. 5000 ped.

Epiphytica, *B. flavido* (Sierra Leone) affine.

Junceæ.

1. Luzula campestris, *L.*

Hab. Ad cacumen Clarence Peak, alt. 10,700 ped. (fl. Dec.)

I have seen no other Tropical African specimens of this plant, nor is any species of the genus mentioned in Richard's 'Flora of Abyssinia.' There is, however, a very similar plant in South Africa.

Cyperaceæ.

1. Carex Boryana, Schkuhr. Forma spica depauperata. (*Boott.*)

Hab. Clarence Peak, 8500 ped. (fl. Dec.)

Dr. Boott, who has identified this and the following for me, observes that he has a similar form from Bourbon, of which isle and Abyssinia this is a native.

2. Carex Wahlenbergiana, *Boott.* Illust. Carex, t. 301.

Hab. Clarence Peak, alt. 8000 ped. (fl. Dec.)

Of these specimens Dr. Boott remarks, that it has pale spikes, and shorter narrower bracts and leaves than the fully developed plants; but that he has the same pale spikes and narrow (but longer) leaves in Bourbon specimens. It is also a native of Mauritius.

3. Kyllingia macrocephala, *A. Rich. Flor. Abyss.* ii. 491.

Hab. Clarence Peak, alt. 8500 ped. (fl. Dec.)

I am very doubtful if this is anything but a form of the ubiquitous *K. monocephala*: the scales are however larger and of a somewhat different shape. Stamens 2.

4. Isolepis trifida: cf. T. pusilla, *Hochst.*, et T. gracillima, *Hochst.*

Hab. Ad cacumen Clarence Peak, alt. 10,700 ped. (fl. Dec.)

A common Indian plant, extending westward to Abyssinia and Senegal, and eastward to China.

5. Schœnus? erraticus, *H.f.* Pusillus, glaberrimus, rigidulus, caule basi bulboso, foliis filiformi-setaceis rigidis curvis supra canaliculatis subtus convexis, culmis nudis curvis filiformibus sulcatis apice monocephalis, capitulo ovoideo compresso e spiculis 1–3 piceis compressis

composito, involucro 1–3-phyllo spiculis breviore, foliolis ovato-lanceolatis acuminatis dorso carinatis, spiculis 5 8 lineari-oblongis compressis vix distiche imbricatis.

Hab. Clarence Peak, alt. 9000 ped. (fl. Dec.)

Herba 3–6-uncialis, culmis basi subbulbosis folia longe superantibus. *Folia* 1–2 pollicaria sulcata, acuminata, vix $\frac{1}{4}'''$ diam. vaginis brevibus rufis non nitentibus. *Capitulum* $\frac{1}{2}''$ long. *Spiculæ* confertæ, lineari-oblongæ, squamæ sub 8-10, infimæ paucæ latiores vacuæ, cæteræ subæquilongæ, oblongo-lanceolatæ, acutæ, vix carinatæ, opacæ, glaberrimæ. *Stamina* 3, discus et setæ hypogynæ 0. *Ovarium* parvum oblongum trigonum, stylo gracili basi simplice, stigmatibus 3 filiformibus.

I am doubtful of the genus of this plant; the scarcely distichous scales of the spikelet differing from *Schœnus*, to which it is otherwise referable. The scales are, however, not always regular in *Schœnus nigricans*, and in *Chætospora*, which must surely be reduced to *Schœnus*, the scales are sometimes imbricated all round. A. Richard's *Hemichlæna bulbosa*, to which this is a good deal allied, has distichous scales, but this plant differs materially from *Hemichlæna* in wanting the disk. I do not see how it differs from *Cyperus*, with many species of which it further agrees in the margins of the scales decurrent on the rachis.

Gramineæ.

1. Deschampsia cæspitosa, *P.B.* *D. latifolia*, Hochst.; A. Rich. Flor. Abyss. ii. 413.

Hab. Clarence Peak, alt. 10,100 ped.

Also found in Abyssinia and most other temperate parts of the globe, but not hitherto in South Africa.

2. Trisetum lachnanthum, *Hochst.*; *A. Richard. Flor. Abyss.* ii. 416.

Hab. Clarence Peak, alt. 7900–9000 ped. (fl. Dec.)

A very distinct species, closely allied to *T. virens*, Nees, of the Indian mountains.

3. Festuca Schimperiana, *A. Rich.* *Flor. Abyss.* ii. 433.

Hab. Clarence Peak, alt. 8500 ped. (fl. Dec.)

The spikelets are rather larger than in the Abyssinian specimens, but the species is evidently the same.

4. Brachypodum sylvaticum, *R. & S.*

Hab. Clarence Peak, alt. 7000 ped.

A native of Abyssinia (*B. flexum*, Nees).

5. Gymnandropogon, sp. ? (*Schimper, Plant. Abyss.* 1853, No. 1006.)

Hab. Clarence Peak, alt. 9000 ped. (fl. Dec.)

This, which approaches very closely *A. glabriusculus*, Hochst., of Abyssinia, further seems identical with another and perhaps undescribed species of that genus, collected by Schimper, and quoted above.

Note on an unusual mode of Germination in the Mango—*Mangifera Indica*.

By Maxwell T. Masters, Esq., F.L.S.

[Read April 4th, 1861.]

In the Museum of the Royal Gardens at Kew, are preserved two specimens of the Mango in an advanced stage of germination, which present some peculiarities that may be deemed worthy of bringing under the notice of the Society. For the opportunity of examining and describing these curious plants, I am under great obligations to Dr. Hooker, and to Mr. Jackson the curator of the Museum. From these gentlemen I learn that the seeds in question were sent home by the late Mr. Barter, when accompanying Dr. Baikie on his second Niger Expedition in 1857, and were reared by Mr. Crocker at Kew.

From the appearance that these young plants presented on cursory inspection, and perhaps from the knowledge that the seeds of the Mango are occasionally poly-embryonous, the specimens were described in these words, "one mango seed producing many plants." The closer examination which I have been enabled to make leads me to conclude that there are, in reality, two seeds, presenting such peculiar appearances, especially when placed, as they were, in close apposition one to the other, as readily to give rise to the opinion before expressed. This will be understood at once by the circumstance of there being only two cotyledons present, from between which a great number of shoots apparently emerge. In one of these two seeds (*fig.* 1.) one cotyledon is present, though partly decayed and truncated at its upper part, possibly by some accident during growth; the other seed-leaf is absent, but there is a scar distinctly visible, indicating its original position. The plumule presents itself as a long, thick, fleshy, curved body, presenting no trace externally of leaves or buds; in the axil of the cotyledon, between it and the plumule, arises a leaf-bearing shoot, presenting no unusual features. The radicle is thick and tapering, and gives off a few slender rootlets. The second seed (*fig.* 2) is likewise deprived of one of its cotyledons, but the scar remains to attest its former presence. From the appearance of the tissues in the immediate vicinity of the scar, the missing seed-leaf seems to have perished from some cause inducing gradual decay, rather than from any injury or traumatic cause, to use a surgical expression. The existing cotyledon is oblong, oblique at the base, the outer surface convex, wrinkled on the upper half, while the lower half is scooped out and smooth like the inside of a shell. From this portion proceed

Fig. 1.

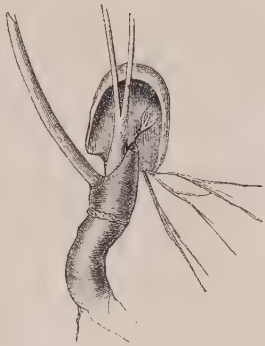


Fig. 3.

Fig. 2.

Fig. 2 outer } aspect of same seed. See reference on other side.
Fig. 3 inner }

a number of adventitious roots. The inner surface (fig. 3) is concave, and offers no unusual appearance; the plumule in this instance is short, thick, fleshy, conical, and gives off, not from its summit, but from its side, some distance above the attachment of the cotyledons, three leafy shoots, one of which is small and but slightly developed, and another is divided into two branches a short distance above its origin. The radicle has a similar appearance to that of the first-mentioned seed.

To sum up the peculiarities presented by these specimens, there is, first, the entire absence of one of the cotyledons in both instances; next, the peculiarity of the plumule, in the one case giving off no shoot at all, in the other giving rise to three shoots from its side; and, lastly, there is the production of adventitious roots from the "scooped-out" portion of the cotyledon.

I do not know any instance of plumules presenting the peculiarities just mentioned, nor have I been able to find on record any case of adventitious roots springing from the cotyledons themselves, though there is no physiological or anatomical reason why, under certain circumstances, adventitious roots should not be developed in such a situation. Irmisch indeed describes similar rootlets arising from the petiole of the cotyledon in *Bunium creticum* and *Carum Bulbocastanum**.

The scooping out of the lower half of the outer surface of the cotyledon may not be an unusual occurrence in mango seeds, though it is certainly not invariable. Griffith describes the cotyledons of this plant as oblique at the base, with half of their outer surface wrinkled, half smooth, sometimes auricled, sometimes not, sometimes of different sizes. The plumule he describes as "stalked and well-marked." Gaertner figures seeds of this plant with apparently lobed cotyledons, the lobes being, as Reinwardt† shows, really separate seed-leaves belonging to distinct embryos; but the descriptions given by these writers by no means apply to the cases I have attempted to describe; nor does Alexander Braun, in his recently published memoir on 'Polyembryonous Plants,' among which mention is made of the Mango, describe anything like them.

* Flora, 1858, pp. 33-42.

† Reinwardt, Nov. Act. Acad. Car. Leop. Nat. Cur. 9-24, 4to, 12, 1, 37.

Reference to the Woodcuts.

The figures are one half the size of the originals; Nos. 2 and 3 refer to the outer and inner aspect of the same seed respectively, but the details of the foliage, etc., are omitted in No. 3.

Account of the Ascent of Clarence Peak, Fernando Po, altitude 10,700 feet. By Mr. Gustav Mann, Botanist to Dr. Baikie's Niger Expedition. In a Letter to Sir W. J. Hooker, F.R.S., F.L.S., &c., and communicated by him.

[Read March 7, 1861.]

Sir,—As I informed you already in my letter before last, that I did not succeed at my first trial in ascending the mountain, I will give you now an account of my second trip, which was successful. On the 23rd of March I left Clarence for the second time, and commenced my ascent from here, keeping first eastwards and then turning south, and attaining the first day a height of 1300 feet. After I had passed two large Boobee towns, Barapa and Basile, finding the vegetation already quite different, I stopped to collect the few plants in blossom, and some nice Ferns, especially Trichomanes and Aspleniums. The trees were much overgrown by Orchids, Ferns, and Begonias, while moss hung a foot in length from the branches: there was in consequence much dry wood at the top of the trees. There were no Palms, nor herbaceous plants 15 feet high, as in the lower part. The temperature here in the mornings was 64°, at noon 70°, and in the evenings 66° Fahr. At about 1000 feet up I found the fine large Trichomanes growing on the ground, and the large Acrosticum?: these I sent in the Wardian case, and have dried specimens of both still here.

On the 27th of March I ascended to a height of 5000 feet: during this ascent I found the fine Cyathea. This species seems to form larger groups than other Cyatheas do, many averaging from 10–15 trunks, some of which rise to a height of 30 feet. The Onychium? of which I sent a specimen in the Wardian case, grows only as an epiphyte on this tree-fern. I also found on this ascent the fine Antrophyum?, resembling the Platycerium of the tropical part of the island; and the Liliaceæ, of which I sent six bulbs; and the Calanthe like Veratrifolia. All the Trichomanes grew between 1000 and 5000 feet. At this height I stopped one day, and ascended on the 28th to a height of 6000 feet, and on the 29th to 8500 feet; up to which height I found very little difference in the vegetation. From this place I was obliged to send a Krooman down to fetch more provisions, which, together with daily rain, obliged me to remain here six days. During this time I was compelled to sleep on the wet ground, placing my blanket

and other things under an oil-cloth when the rain commenced at night, and selecting for myself a dry place where the rain did not come through the small roof of palm-leaves. This, under a temperature of 42° Fahr. at night, was a trial to my health; but one must learn everywhere, and I have learnt a great deal since I came here. The vegetation here consists mostly of herbaceous plants, as Gramineæ, Salvia, Rubus, &c. The largest trees here (50 feet high) are Araliaceæ and Compositæ. On the 3rd of April I reached the top, about two o'clock in the afternoon. Unfortunately a storm of rain and hail spoilt the enjoyment with which I should otherwise have seen the whole island spread out before me; but what was worse than this, I found the entire summit burnt, and no vegetation except grass, which was just beginning to sprout. This is done by the Boobees, to drive the deer to the lower part of the island. I did not meet with a Boobee above 1000 feet elevation. The top is formed by the highest side of the largest crater, which is about 40 feet deep. There is good and deep soil up to the top, and only on the inside of the largest crater are a few rocks visible. Lower down there are more small craters. At this time the temperature was 54° F., and the minimum at night 39° F.

Shrubs grow to between 400 and 500 feet of the top, and amongst them I found an Erica 8–10 feet high, which gave me much pleasure. I regret very much that I could not stop some days longer, but I ran the risk of making myself a cripple for life; I therefore commenced my descent on the 4th. Again it was too late in the season, for which reason very few plants were in blossom.

At the bottom of the highest part I found a small lake, perhaps only the result of the very heavy rain of the last few days. The large Hypericum forms the greatest part of the bush, and has a very pretty appearance from its fine light-green foliage. The first day I descended to 5000 feet, and on the 5th I went down to 1300 feet, where I remained six days, making excursions in different directions. The tree-fern and other living plants were collected the day before I set off on my return to Clarence, which place I reached on the 13th of April, and immediately commenced the arrangement of my plants, &c., being anxious to send away my collections by the last mail. After coming down from the mountain I needed a little rest, but having this work before me, I rather overworked myself, and took fever, which was the reason why I did not write to you by the last mail. I should be very

glad to hear how the plants and specimens reached Kew, and if all was done to your satisfaction. It would also give me much pleasure if I heard that there was anything new among them. Yesterday I obtained a fruit spike of *Raphia vinifera*, 6 feet long, and so heavy that two men could scarcely carry it. Raphia is scarce on this part of the island, but is more abundant on the eastern side, because that part is lower, and this palm prefers a low swampy situation. It is much used, all the houses being roofed with its leaves. Next time I will send you some mats made from it, as they may be of interest for the Museum. At the north-west bay of the island an excellent sort of yam grows, quite like a good potato; on the eastern side they grow much larger, but are not nearly so good in quality. On the eastern side I also found good cotton, growing quite wild, and only gathered by the people when they have nothing else to do.

The whole island is uncultivated, with the exception of a small part near Clarence, for the yam-fields can scarcely be considered as cultivation. From February until now is the active time of year. In February the Boobees plant their yams, and in March the palm-oil season commences: the men bring home the nuts, and the women make and sell the oil. The island would yield ten times as much palm-oil, if the Boobees would make use of all that is growing; but these people have so few necessaries of life that they are not to be depended on.

To ascend the mountain one needs a good oiled tent with a hammock, and tin boxes to put everything in: an hour after I had dried my plants by the fire they were wet again, and I had therefore great difficulty in preserving them. It also requires at least six Kroomen to assist in the dry season. I have now quite recovered my health, and hope shortly to benefit by change of air when the ship goes up the river. I never thought that the difference of climate on the mountain and here would have had so much effect on me. On the mountain I enjoyed good health, except that I took a bad cold, from not having a sheltered place at night. By this mail I expected instructions from the Foreign Office, since till now I have received none at all, except that money has been granted to live on, and to go up the mountain, and for one Krooman to assist me. If the Expedition goes up the Niger again (which is doubtful), the collections will be entirely different.

I enclose a little sketch of the Consulate, thinking it may be of interest to you. Consul Hutchinson and his lady are going home

to England; I shall thus lose a very kind friend, who has been like a brother to me. I heard from Mr. Hewen that you had inquired if it were possible to ascend the mountain of Bimbia or Cameron. You will hear shortly that it is quite impossible, and only killing men to send them up there; this, however, was also told me before I went up Clarence Peak. It is, no doubt, *very* difficult, but it is possible; only too much must not be expected from the first trip. Much might be gained by a second ascent; as would also, I think, be the case, if I could ascend the Peak here again, and remain there for some months during the dry season. To stop there in the wet season is quite impossible, and would be certain death.

GUSTAV MANN.

Clarence, Fernando Po,
May 31st, 1860.

On the Discovery of *Carex ericetorum*, Poll., as a Native of Britain.

By CHARLES C. BABINGTON, M.A., F.R.S., F.L.S., Professor of Botany in the University of Cambridge.

[Read June 20, 1861.]

SEVERAL months since my friend Mr. John Ball, F.L.S., sent to me a specimen of *Carex*, gathered by him on the Gogmagog Hills in Cambridgeshire in the year 1838, and upon a careful examination of my Herbarium I found four specimens of the same plant, gathered at the same place on May 3, 1838, and probably in company with Mr. Ball. This plant was supposed by Dr. Boott to be the *C. ericetorum*, Poll. On referring to my notes I was enabled to ascertain the places visited on the above-mentioned day, and have lately revisited them more than once. At length, on May 28, 1861, I was so fortunate as to rediscover a single rather large patch of the same *Carex*, growing on the grassy slope of the Roman road, locally called the Wool Street, at about four miles and a half from Cambridge, and probably not far from the spot where it was gathered in 1838.

As I have now no doubt of its being the *C. ericetorum*, and a true native of the country, I venture to announce it as an addition to the British flora. This is no "split" from a recognized species, but a plant allowed by botanists to be a true species. At first sight it much resembles *C. præcox*, and inhabiting similar ground, may have been overlooked in many places. To the practised eye it has a decidedly different appearance when growing;

for the white edge of the scales of both kinds of its spikes gives it a silvery look very different from the dark hue of the *C. præcox*. The place where it grows is chalky and very dry, and there is an abundance of *C. præcox* in its neighbourhood. Although I have as yet only met with one patch of it, its restriction to that one spot is highly improbable; but unfortunately the chalk district of Cambridgeshire is so universally under the plough that few fit places for its growth now remain. It should be carefully looked for in similar places elsewhere in the south-east of England.

It may be known by the following characters:—Its fertile spikes are more ovoid and closer together than those of *C. præcox*; its glumes obovate, very blunt, with a pale margin, which is finely ciliated, especially at their tip; their midrib does not reach to the tip; its fruit is obovate. The nut I have not been able to examine, owing to the young state of the fruit. My specimens are about 3 or 4 inches high.

It is the *C. ericetorum* of Pollick (*Fl. Palatin.* ii. 480. A.D. 1777) and of other authors, the *C. ciliata* of Willdenow (in *Act. Berol.* for 1794. p. 47. t. 3. fig. 2) and others. The latter name would be much more characteristic of the plant, but the dates of publication conclusively determine that Pollick's name must be adopted.

On some Species of Oaks from Northern China, collected by W. F. Daniell, Esq., M.D., F.L.S. By William Carruthers, Esq., F.L.S.

[Read June 20th, 1861.]

On returning from the late expedition to China, Dr. Daniell placed in my hands the specimens of several oaks which he had gathered on the shores of Taliewhan, a bay running into Southern Manchouria, to the west of the Corea, and chiefly in a small valley about a mile from the sea, where they grew mixed with *Pinus densiflora*, Sieb., *Salix Babylonica*, L., &c. The specimens belong to six species, three of which are new and undescribed. Two of these species, however, want flowers and fruit, and although remarkable in the shape and characters of their leaves, and different from anything hitherto noticed, I have not ventured to name and describe them from the foliage only. I have added a fourth species which I found among the plants, now in the Herbarium of the British Museum, brought home by Sir George Staunton from Northern China.

All of them, in which the fruit is known, belong to Blume's

section of the genus characterized by the acorn cup having imbricated scales, and named by Endlicher *Lepidobalanus*. They are

1. Q. obovata, *Bge.*
2. Q. Mongolica, *Fisch.*
3. Q. McCormickii, n. sp.
4. Q. serrata, *Thunb.*
5. Q.—sp.?
6. Q.—sp.?
7. Q. acuminatissima, n. sp.

1. Quercus obovata, *Bge. Mem. St. Petersb.* vol. ii. p. 136.

Hab. From Taliewhan, *Dr. Daniell*; and between Pekin and Jehol, *Sir George Staunton.*

2. Quercus Mongolica, *Fisch*; *Ledebour Flora Rossica*, vol. iii. p. 589. Foliis petiolatis vel subsessilibus obovatis, basi auriculata sinuato-lobata, a medio ad basin cuneato-attenuatis sinuato-lobatis, lobis sursum versis subacutis muticis a medio utrinque decrescentibus, sinubus acutis, subtus glaucis glabris; cupula squamis adpressis gibbosis sericeis muricata, squamis superioribus parvis cupulam non excedentibus; nuce ovata cupulam duplo excedente styli basi apiculata.

Hab. From Taliewhan, *Dr. Daniell*; and between Pekin and Jehol, *Sir George Staunton.*

From the fine specimens given me by Dr. Daniell I have slightly amended the character of this species: this was the more needed to separate it clearly from the following.

3. Quercus McCormickii. Foliis breviter petiolatis obovatis, basi lobata, a medio ad basin cuneato-attenuatis sinuato-lobatis, lobis sursum versis rotundato-obtusis muticis a medio utrinque decrescentibus, sinubus acutioribus, subtus glaucis, glabris vel rarius subtus ad venas pilis raris obsitis; cupulæ squamis externis triangulatis sericeis, internis membranaceis lineari-lanceolatis margine et apice ciliatis cupulam valde excedentibus; nuce rotundata cupulæ squamas vix excedente styli basi apiculata.

Hab. From Taliewhan, *Dr. Daniell.*

The difference between the foliage of this species and the preceding is so trifling, that, but for the fruit, it would be difficult to separate them. The shape of the acorn, and especially the scales of the cup, however, supply obvious and striking peculiarities. Instead of the compact scales of *Q. Mongolica*, Fisch., the cup is nearer that of *Q. obovata*, Bge.; but the scales are more compact, shorter, and more erect.

4. Quercus serrata, *Thunb. Flor. Jap.* p. 176.

Hab. From Taliewhan, *Dr. Daniell.*

5. Quercus, sp.

Hab. From Taliewhan, *Dr. Daniell.*

This is a shrub, growing to the height of 6–10 feet. It appears to be nearly related to *Q. serrata*, Thunb., both having the leaves glabrous above and glaucous below, from a compact covering of small white hairs, and having also the veins running out into setæ; but the

uniform obovate shape of the leaves, and the almost entire absence of the petiole (scarcely exceeding a line in length, as opposed to an inch in *Q. serrata*, Thunb.) strikingly separate it from that species.

6. Quercus, sp.

Hab. Taliewhan, *Dr. Daniell.*

This is also a dwarf oak, from 6 to 10 feet high. It differs from *Q. Chinensis*, Bge., which seems to be its nearest ally, in wanting the glaucous or canescent covering on the under surface of the leaf (both sides being equally glabrous, and nearly of the same colour), and in the remarkable panduriform shape of the nearly sessile leaf. The petiole is 1–2 lines long.

7. Quercus acutissima. Foliis petiolatis, e basi rotundata vel obtusiuscula ovato-lanceolatis acutissimis serratis, serraturis setaceo-excurrentibus, venis et setis sursum spectantibus glabris; fructibus breviter pedunculatis; cupulæ squamis sericeis, externis parvis, internis elongatis subulatis cupulam excedentibus.

Hab. Chinese province of Kiangsi, *Sir George Staunton.*

The form of the leaf separates this species from the last, and the glabrous under-surface as well as the remarkable difference in the fruit separate it from *Q. serrata*, Thunb., under which name specimens of it have been distributed by Dr. Asa Gray. The veins and the setæ are directed more upwards than in the allied species. The petiole is 5–8 lines long.

On the identification of the Grasses of Linnæus's Herbarium, now in possession of the Linnean Society of London. By Colonel William Munro, 39th Regt., C.B., Chevalier of the Legion of Honour, F.L.S., &c.

[Read April 4th, 1861.]

I beg to offer to the Linnean Society, as the envied possessors of the original authenticated collections of Linnæus himself, the accompanying notes on the identification of the various grasses contained in his Herbarium.

Hoping that ere very long I shall be able to offer to botanists a full account of all grasses at present known in collections, I have devoted considerable time to the identification of the species of the earliest authors, with the view of clearing up some of the numerous mistakes in synonymy, which add so very much to the labours of any systematic botanist who wishes to treat any natural order in a really scientific spirit. Amongst grasses I find the errors extraordinarily numerous. Many of these might have been avoided by consulting herbaria easily accessible; and very many might

have been avoided by a little care, and less anxiety for the creation of species. With many, a difference in locality seems to have been quite sufficient reason for giving a different specific name. This idea was not consequent on following in Linnæus's steps. In the comparatively few mistakes he has made, he has erred in the contrary direction, and placed in one species two or three very different plants. In another respect Linnæus's example might have been well followed. He had great regard to the priority of names; and although he was the first to apply specific ones, he has frequently, as his MSS. show, altered his own, because he found previous terms, that would answer for specific and generic names, had been used by Gronovius, Scheuchzer, and others. Linnæus appears to have paid great attention to the Gramineæ. The specimens are in remarkably good condition, and in only two instances are they insufficient for absolute identification.

The numbers in the Herbarium refer to those used in the first edition of the 'Species Plantarum,' Linnæus's own copy being very carefully marked by himself. In the following list I have used these numbers, *underlining* them, as was done by Linnæus himself, thus 1, 2, &c., to imply that the plant was actually in the Herbarium. When Linnæus's name remains unaltered in the best authors of the present day, I have marked the plant with ! after the name, as, 1. *Lygeum Spartum*, L.! I have carefully examined every grass in the Herbarium; and in annexing the following list of names which I consider they should bear, I trust the list may be of some little use to botanists who are unable to consult the Herbarium itself. I have inserted all the names contained in the following works by Linnæus:—first, all in the 1st edition of the 'Species Plantarum,' published 1753; then all extra in the 2nd edition, published in 1762; then all in the two Parts of the 'Mantissa' (as far as p. 143 published in 1767, and from that to the end in 1771), which Linnæus styles a supplement to the 6th edition of the 'Genera Plantarum' and to the 2nd edition of the 'Species Plantarum.' I have also included all published in a paper entitled "A First and Second Century of Plants collected in various parts of the world, by Kalm, Osbeck, Loefling and others," in the 4th volume of the 'Amœnitates Academicæ' (1759), and, further, all grasses contained in a paper on the plants of Jamaica sent by Browne, in the 5th volume of 'Am. Acad.' (1760). These, with the exception of about half-a-dozen described in the 'Systema Naturæ,' also included in this list, appear to me to comprise all the grasses for the nomenclature of which Linnæus is personally responsible.

I have also occasionally added a few notes on some of the grasses of the younger Linnæus, which are in the Herbarium.

Stoke Bishop, near Bristol,
February 18th, 1861.

Cinna, *Sp. Pl.* 1st edit. p. 5.

1. *Cinna arundinacea*, L.! The specimen is from the Upsal Garden, raised from seeds sent by Kalm from North America, where the plant is common. In the same envelope, without number or locality, is a specimen of *Hymenachne Myurus*, P. de B.

Anthoxanthum, *l. c.* p. 28.

1. *A. adnatum*, L. The well-known vernal grass. The only species, in the Herbarium, of the genus.

2. *A. Indicum* is stated to be No. 25 Fl. Zeyl., which is in Hermann's Herb. vol. v. fol. 29, and is *Perotis latifolia*, Ait., very fairly figured by Plukenet, t. 119. f. 1.

3. *A. paniculatum*, described by Linn. as having 4-flowered spikes. I am unable to decide positively what this is; but Kunth is probably correct when he states it is a synonym of *Festuca spadicea*, Gouan.

Nardus, *l. c.* p. 53.

1. *N. stricta*, L.!

2. *N. Gangitis* is *Lepturus incurvatus*, Trin. The specimen collected at Montpellier. Much confusion has been occasioned by the drawings erroneously quoted by Linnæus. Lobel, Icon. 84 is one of leaves only, and is, I believe, *Andropogon laniger*, Desf.; Morison, t. 13. f. 8 is *Ctenium Americanum*; hence Kunth quotes *N. Gangitis*, Linn., as a synonym of that plant. Why the name *Gangitis* was given to a plant collected in the South of France, it is difficult to explain, except from some confusion regarding Lobel's plant, which is one of those believed to produce the Nard of the ancients. The specimen is to be found amongst *Festuca*, q. v.

3. *N. ciliaris* is *Ischæmum leersioides*, Munro in Seemann's Herb.

4. *N. articulatus*. There is no specimen of this; and it is omitted in the 2nd edition.

N. aristatus, 2nd edit. p. 78, from Rome, is *Psilurus nardoides*, Trin.

N. Indica, Linn. Herb., is *Microchloa setacea*, R. Br.

N. Thomæ, Linn. Herb., is *Oropetium Thomæum*, Trin.

LYGEUM, *Sp. Pl.* 2nd edit. p. 78.

1. *L. spartum*, L.!

CORNUCOPIÆ, *Sp. Pl.* 1st edit. p. 54.

1. *C. cucullatum*, L.!

C. alopecuroides, Mant. p. 28 (1767), is *Alopecurus utriculatus*, Pers.

SACCHARUM, *l. c.* p. 54.

1. *Saccharum officinarum*. The specimen marked by Linnæus himself is not the true Sugar-cane, but is *Erianthus Japonicus*, P. de B. It is also wrongly marked in pencil, "*Sacch. polystachyum*, Sw.?" which is *Panicum ferrugineum*, Kunth. The reference to Sloane, Jam. p. 108, t. 66, is correct, that being a very fair drawing of the true Sugar-cane.

2. *S. spicatum* is *Imperata arundinacea*, Cyrill. One specimen is from C. B. S., and another has been named by Smith *Perotis latifolia*, β, Willd., i. 324, where, however, the confusion is very great, two or three different plants being confounded together.

S. spontaneum, L.! Mant. p. 183, from Koenig.

S. Ravennæ, Linn. Herb., is *Erianthus Ravennæ*.

PHALARIS, *l. c.* p. 54.

1. *P. Canariensis*, L.!

2. *P. phleoides* is *Phleum Boehmeri*, Wib.

3. *P. arundinacea*, L.!

4. *P. erucæformis* is *Beckmannia erucæformis*, Host.

5. *P. oryzoides*. One, from Gronovius, is *Leersia oryzoides*, Sw.; another specimen, from Browne, is *Leersia hexandra*, Sw.

The following also in Herbarium:—

P. bulbosa, Amœn. Acad. iv. 264; 2nd edit. Sp. Pl. p. 79, is *Phleum tenue*, Schrad.

P. aquatica! Am. Ac. *l. c.*

P. zizanioides, Mant. 183, is *Andropogon muricatus*, Retz.

P. tuberosa, Mant. 557, is marked by Smith as *P. nodosa*, Syst. Veg., and is the plant now so called.

P. paradoxa, Linn. Herb., from Upsal Garden, is the plant so called now. In MS. notes to 1st edit. it is called by Linn. *P. utriculosa*, with a marginal note "*P. paradoxa*, 1665."

PASPALUM

is not a genus of the 1st edit., but appears in the 2nd, p. 81; and the following species are in the Herbarium:—

P. dissectum, L.! From North America, *Kalm*. This was published in 1st edit. Sp. Pl. p. 57, as *Panicum dissectum*. Pinned to this is a specimen of *Paspalum conjugatum*, Berg.

P. virgatum, L.! From Browne, well figured by Sloane, t. 69. fig. 2.

P. paniculatum, L.! Another specimen, pinned to this, and also marked *paniculatum*, is *Paspalum fluitans*, Kunth.

P. distichum! Amœn. Acad. v. 391, from Jamaica, *Browne*.

P. scrobiculatam, L.! Mant. 29. Raised in the Upsal Garden, from seeds received from India.

A plant marked by Linn. "*Paspalum*," and by Smith "*pubescens*, Br. Prod. i. 188?" is *Paspalum granulare*, Trin.

In the same envelope, merely marked C. B. S., is a specimen of *Eustachys petræa*, Desv.

Panicum, *Sp. Pl.* 1st edit. p. 55.

1. *P. alopecuroideum* is *Gymnothrix Thouarii*, P. de B. Received by Linnæus from China. The reference to Plukenet, t. 119. f. 1, is incorrect, as that is *Perotis latifolia*, Ait. The reference in 2nd edit. f. 82, to Pluk. t. 92. f. 5, is probably correct.

2. *P. polystachyum*. The specimen is *Pennisetum barbatum*, Schult. Another, from the Upsal Garden, is *Setaria glauca*, P. de B., stated to have been raised from American seeds. Another is *Setaria viridis*, P. de B., and another, also marked 2, and pinned to the others, is *S. verticillata*, P. de B.

3. *P. Americanum*. There is no specimen in Herb.; and the plant is omitted in the 2nd edition.

4. *P. Italicum* is *Setaria Italica*, Kunth. Another specimen, from Upsal Garden, is named *P. Germanicum* by Linnæus.

5. *P. Crus Galli*, L.! A small state, from Kalm.

6. *P. dissectum*. Already referred to as *Paspalum dissectum*.

7. *P. dimidiatum* is *Stenotaphrum Americanum*, Schrank. The specimen from India.

8. *P.* (*Digitaria*) *sanguinale*! L.

9. *P. filiforme*, from Kalm, is *Paspalum filiforme*, Sw. This contains also a piece of *Muhlenbergia diffusa*, Willd. Another sheet, from Upsal Garden, contains *P. sanguinale*, L.

10. *P. compositum*. The plant was originally described from Fl. Zeyl. 42, and is what is now called *Oplismenus compositus*; but the specimen in the Herbarium is *Oplismenus Burmanni*.

11. *P. dichotomum*, L.! From Kalm, and is the plant described by A. Gray as *dichotomum*.

12. *P. clandestinum*, L.! From Kalm also, a form of *P. latifolium*, L. Linnæus's reference to Sloane, t. 80, is erroneous, as that is a species of *Manisuris*.

13. *P. capillare*, L.! From the Upsal Garden.

14. *P. patens*, L.!

15. *P. dactylon* is *Cynodon dactylon*, Pers.

16. *P. miliaceum*, L.!

17. *P. latifolium*, L.! From Kalm, North America. A specimen attached to this from Carolina is *P. divaricatum*, L., to which Sloane's figure, t. 71. f. 3, belongs; another, marked *latifolium*, is *P. oryzoides*, Sw.

18. *P. brevifolium*, L.! Allied to *P. patens*. The specimen was from India; but the reference to Plukenet, t. 189, f. 4, is erroneous, that being *Isachne australis*.

19. *P. arborescens* is *P. notatum*, Retz. Obs. iv. 18, and is very different from the *arborescens* of Fl. Zeyl. 43, of which there is a specimen in Hermann's Herb., and is probably *P. patens*. On the same sheet in Linnæus's Herb. are some portions of a species of *Arundinaria*, which may have been the origin of *arborescens*.

20. *P. virgatum*, L.! From Gronovius.

P. verticillatum, 2nd edit. p. 82, is *Setaria verticillata*: vide No. 2, ante.

P. glaucum, *l. c.* 83, is *S. glauca*, P. de B.

P. viride, *l. c.* 83, is *S. viridis*, P. de B.

P. hirtellum, Am. Acad. v. 391, from Jamaica, is *Oplismenus Burmanni*, P. de B.

P. Crus Corvi, L.! 2nd edit. p. 84. From a garden.

P. colonum, L.! 2nd edit. p. 84, also marked *P. brizoides*. One from Browne is true *colonum*; another, marked *colonum*, is *Echinochloa Crus Galli*.

P. lineare, *l. c.* p. 85.

P. grossarium, L.! Am. Acad. v. 392. This plant is often called *P. pubescens*.

P. divaricatum, L.! Am. Acad. v. 392. From Jamaica. This plant has often been confounded with *P. latifolium*, and bears the names of *P. ruscifolium*, *maculatum*, *glutinosum*, and *agglutinans*. Another specimen of *divaricatum* is marked *arborescens* by Smith.

P. repens, L.! 2nd edit. Sp. Pl. p. 87. This is *P. arenarium*, Brotero.

P. brizoides, Mant. 184, is *P. colonum*. See above.

P. conglomeratum, Mant. 324, is, I suppose, the same as *P. Indicum*; there is, however, no specimen so marked.

P. distachyon, L.! Mant. 183. Closely allied to *P. Petiverii*, Trin., with only two spikes.

P. ramosum, L.! Mant. 29, from the Upsal Garden. A common species in India, closely allied to *P. grossarium*.

P. coloratum, L.! Mant. 30, from Upsal Garden. This approaches *P. virgatum* very closely, and is unlike any uncultivated plant I have seen. Smith quotes Jacquin, Icon. Rar. i. t. 12.

P. curvatum, L.! Syst. Nat. xii. 732, is a loosely flowered state of what is usually called *P. interruptum*, Willd. The specimen is marked by Smith as "*Holcus striatus*."

P. Indicum, L.! Herb. Linn., Mant. 184, from Koenig. This is also marked *Panicum Johannæ*. A very small simple state.

P. incurvum, Linn. Herb., is a hairy-glumed state of the preceding, also marked by Smith as *Holcus striatus*.

P. musciparum, Linn. Herb., which I cannot find described anywhere, is *P. miliare*, Lam.

P. oryzoides, Herb. Linn., marked "Ard. Spec. 2, t. 5," is *Echinochloa stagnina*, P. de B.

No. 516, placed in *Panicum*, is *Sporobolus Indicus*, R. Br.; and

No. 513, also so placed, is *Eragrostis brizoides*, N. ab E.

Phleum, *Sp. Pl.* 1st edit. p. 59.

1. *P. pratense*, L.!
2. *P. alpinum*, L.!
3. *P. arenarium*, L.!
4. *P. schœnoides* is *Crypsis schœnoides*, Lam.

P. nodosum, Sp. Pl. 2nd edit. p. 88, is only a form of *P. pratense*.

Alopecurus, *l. c.* p. 60.

1. *A. pratensis*, L.!
2. *A. geniculatus*, L.!
3. *A. hordeiformis* is *Gymnothrix cenchroides*, R. et Sch.
4. *A. Monspeliensis* is *Polypogon Monspeliensis*, Desf.

A. agrestis, L.! 2nd edit. p. 89.

A. paniceus, 2nd edit. p. 90, is called *Cynosurus paniceus* in 1st edit., and is *Polypogon maritimus*, Willd.

Alopecuroides, so marked in Linn. Herb., is *Gymnothrix Thouarii*, P. de B.; and another so called is *Penicillaria spicata*, Willd., marked by Smith as "*Alopecurus indicus*, Syst.Veg., sent by Afzelius as *Holcus spicatus mas*."

MILIUM, *Sp. Pl.* 1st edit. p. 61.

1. *M. effusum*, L.!

2. *M. confertum* is *Piptatherum*.

M. paradoxum, 2nd edit. p. 90, called *Agrostis paradoxa* in 1st edit., is *Piptatherum paradoxum*, P. de B.; and one pinned to it, from Carniola, is *Piptatherum virescens* of Trin.

M. lendigerum, 2nd edit. p. 91, is *Gastridium australe*, P. de B.

M. punctatum, Am. Acad. v. 392, from Jamaica, Browne, is *Helopus pilosus*, Trin.

M. capense, Mant. 185, is *Danthonia* (*Pentaschistis*) *papillosa*, N. ab E., or an allied species.

AGROSTIS, *l. c.* p. 61.

1. *A. Spica Venti* is *Apera Spica Venti*, P. de B.

2. *A. miliacea*, from Upsal Garden, is *Piptatherum multiflorum*, P. de B., as also is another, marked *A. sepium*.

3. *A. arundinacea* is *Deyeuxia sylvatica*.

4. *A. rubra*. Not in Herb.

5. *A. canina*, L.! Smith has marked one specimen of this "*capillaris*, Huds. nec Linn.; *Agrostis vulgaris*, Fl. Brit.; *tenuis*, Sibth."

6. *A. paradoxa* is *Milium paradoxum*, referred to above.

7. *A. stolonifera*. The Herbarium contains one of the forms of *A. vulgaris*, which is called *stolonifera*, the Fiorin Grass; another, marked *stolonifera* by Linn., is *A. verticillata*, Vill.

8. *A. capillaris*, L.!

9. *A. alba*, L.! An unawned state; and pinned to it is a specimen of *A. canina*.

10. *A. minima* is *Mibora verna*, Adans.

11. *A. Virginica* is *Vilfa Virginica*, P. de B.; and pinned to it is a specimen from Kalm of *Sporobolus heterolepis*, A. Gray.

12. *A. Indica*, from Browne, is *Sporobolus Indicus*, R. Br.; and pinned to it is a specimen of *Polypogon Monspeliensis*, Desf., also marked by Linn. "*Indica* 12." The reference to Pluk. t. 191. f. 5, is erroneous, as that is *Heteropogon contortus*.

A. Calamogrostis, Sp. Pl. 2nd edit. p. 92. Not in Herb.

A. interrupta, Sp. Pl. 2nd ed. p. 92. Not in Herb.

A. radiata, Am. Acad. v. 392, from Browne, is *Chloris radiata*, Sw.

A. cruciata, Sp. Pl. 2nd ed. p. 94, from Browne, is *Chloris cruciata*, Sw.

A. bromoides, Mant. 30, is *Aristella bromoides*, Bertol.

A. australis, Mant. 30, is *Gastridium australe*, P. de B.

A. serotina, *l. c.* 30, is *Diplachne serotina*, Link.

A. Matrella, *l. c.* 185, is *Zoysia pungens*, Willd.

A. pumila, L.! *l. c.* 31, I think a good species, although included by Kunth and others in *A. vulgaris*. It is about 3 inches high.

A. Mexicana, *l. c.* 31, from Upsal Garden, is *Muhlenbergia Mexicana*, Trin.

A. Cornucopiæ, Linn. Herb., from Kalm, is the plant properly so called now, and which has been subdivided into *A. laxiflora*, *A. scabra*, *A. Michauxii*, &c. The naming is not in Linnæus's handwriting.

A. tenacissima, Linn. Herb., is *Muhlenbergia sobolifera*, Trin.

A. maritima, Linn. Herb., from Klein, is *Vilfa pungens*, P. de B., also *Phalaris disticha*, Forsk.

A. aurea, Hall, 1498, is *Agrostis setacea*, Curtis.

A. No. 20 is *Hymenachne Myurus*, P. de B.

A. without a specific name is *Leptochloa virgata*, P. de B.

The same envelope contains a species of *Chusquea* from Browne, a specimen of *Poa nemoralis*, of *Deyeuxia neglecta*, and *Festuca sylvatica*, none named.

AIRA, *Sp. Pl.* 1st edit. p. 63.

1. *A. spicata*. In the 2nd edition this name is altered to *A. Indica*. It is *Panicum Indicum*, L. The specimen is marked by Linn. "*Panicum*," and a reference is made to Mant. 184, where the plant is described as *Panicum Indicum*. *A. spicata* of 2nd edition, p. 95, is *Trisetum subspicatum*, P. de B.

2. *A. cristata*. Not in Herb. Probably *Kœleria aristata*. See No. 12, below.

3. *A. cærulea* is *Molinia cærulea*, Mœnch.

4. *A. arundinacea*. Not in Herb.

5. *A. minuta*. A small state of *Airopsis agrostidea*, Cand.

6. *A. aquatica* is *Catabrosa aquatica*, P. de B.

7. *A. subspicatum* is *Trisetum subspicatum*, P. de B.

8. *A. cæspitosa* is *Deschampsia cæspitosa*, P. de B. A viviparous speci-

men from Lapland is marked by Smith as "*lævigata* fide Don;" a species of *Poa nemoralis* is pinned to it.

9. *A. flexuosa* is *Deschampsia flexuosa*.

10. *A. montana*. Part is *Agrostis rupestris*, All.; part is *Poa flexuosa*, Wahl.; and another, marked "from China, Osbeck," is *Eriachne Hookeri*, Munro in Hb. Hooker., from Assam and Tenasserim.

11. *A. alpina* is *Deschampsia alpina*.

12. *A. canescens* is *Corynephorus canescens*, P. de B.; and pinned to it are two specimens of *Kœleria cristata*, which probably belong to No. 2.

13. *A. præcox*, L.!

14. *A. caryophyllea*, L.! Pinned to it is a specimen of *Poa annua*.

A. capensis, Linn. Herb., is *Ehrharta calycina*, Sm. The same envelope contains a specimen of *Sporobolus Indicus*, and a *Brizopyrum* from C. B. S.

MELICA, *Sp. Pl.* 1st edit. p. 66.

1. *M. ciliata*, L.!

2. *M. nutans*, L.!

3. *M. altissima*, L.!

M. papilionacea, L.! Mant. 31. From Brazil, *Arduin.* Linnæus also called this, in MS., *M. spectabilis*.

M. minuta, L.! Mant. 32.

M. Falx, Linn. fil. Supp. 109, is *Harpechloa capensis*, Kunth.

M. cynosuroides, Linn. Herb., is *Enteropogon melicoides*, Nees.

POA, *l. c.* p. 67.

1. *P. aquatica* is *Glyceria aquatica*, Sm.

2. *P. alpina*, L.! Two specimens, one of which is from Lapland, are true *P. alpina*; and there are two of *P. trivialis*. Linn. in MSS. says *alpina* may be a form of *trivialis*.

β. *vivipara*. Of this there are three sheets, all *P. alpina*, except part of one, which is *Festuca ovina* viviparous.

3. *P. trivialis*, L.!

4. *P. angustifolia*. One specimen is *P. pratensis*, var. *angustifolia*; and another, pinned to it, is *P. nemoralis*; another is *P. annua*.

5. *P. pratensis*, so marked by Linn. fil., is *P. alpina*.

6. *P. annua*, L.!

7. *P. flava*, marked Gron. Virg. 13, is *Poa crocata*, Michx.; but that name should be altered to *P. flava*.

8. *P. pilosa*. Not in Herb.

9. *P. amabilis*, L.! This is the plant which is generally called *P.* (*Eragrostis*) *plumosa*, Link. It is also Hermann's species (fide Herb. ii. 59!) from which *Fl. Zeyl.* 46 is described, and is Pluk. t. 300. f. 2, marked in the margin, by Linnæus himself, *P. amabilis*, and to be found in Plukenet's Herb. i. 187, from Cape Comorin. The plant generally called *P. amabilis* is *P.* (*Erag.*) *unioloides*, and is also to be found in Plukenet's Herb. *l. c.*

10. *P. Eragrostis*, L.!

11. *P. capillaris*, L.! One from Kalm; another from Sloane, figured at t. 72; and another from Upsal Garden: all true *P.* (*Erag.*) *capillaris*.

12. *P. Malabarica* is *Panicum Arnottianum*, Nees. The reference to Rheede is correct; it is a very fair drawing.

13. *P. Chinensis*, sent by Osbeck from China, is *Leptochloa Chinensis*, Nees.

14. *P. tenella*. There is much confusion about this plant. There is no specimen in the Herb. of what is now considered *tenella*. One from India marked *tenella* by Linn. is the same as No. 9, above, *P. amabilis*; and Linnæus has written a long MS. description on the specimen. Rumph. Amb. 6, t. 4. f. 3, is a good drawing, and is marked by Linnæus himself as *Poa tenella*. Rheede, if correctly quoted, is a miserable drawing. Pluk. t. 300. f. 2 is *P. amabilis*. I therefore consider that all above belong to *P. amabilis*, and that the *P. tenella* ultimately intended by Linnæus is what is now called *Eragrostis tenuissima*, Schrad., is Pluk. t. 190. f. 4, and is in his Herb. i. 186!

15. *P. compressa*, from Upsal Garden, is ordinary *Poa pratensis*.

16. *P. nemoralis*, L.! Seven sheets are correct; one, also so marked, from Kalm, is *Reboulea gracilis*, Kunth; *Reboulea truncata*, Torr.

17. *P. bulbosa*, L.! All viviparous except one specimen with very narrow leaves and extremely similar to *P. ligulata*, Boiss.

P. palustris, 2nd edit. Sp. Pl. p. 98. Not in Herb.

P. rigida, Am. Acad. iv. 265, is *Festuca rigida*, Kunth.

P. ciliaris, L.! Am. Acad. v. 392. From Jamaica, *Browne*.

P. spicata, Mant. 32. Not in Herb.

P. distans, Mant. 32, is *Sclerochloa arenaria*, Nees. This is marked by Linnæus "*Aira aquatica*."

A plant marked *Poa* by Linn., and *Aira cristata*, No. 14, by some other person, is *Kœleria cristata*, Pers.

"*Poa juncea*, &c., Hall. Hist. 1459," is *Festuca spadicea*, Gouan. The same envelope also contains a specimen of *Poa arctica* and *Eragrostis bifaria*, Vahl, both unnamed.

Briza, *Sp. Pl.* 1st edit. p. 70.

1. *B. minor*, L.!
2. *B. media*, L.!
3. *B. maxima*, L.!
4. *B. Eragrostis.* One specimen from Kalm, and one marked "Morison, Hist. 204, t. 6. f. 52," are both *Poa Eragrostis*, L.! One marked C. B. S. 384, is *Eragrostis Chapellieri*, Kunth.

B. virens, 2nd edit. p. 103, is merely a form of *B. media*. One specimen is marked by Linnæus "*B. anceps*."

Uniola, *l. c.* p. 71.

1. *U. paniculata*, L.! Pluk. t. 32. f. 6 is a good drawing.
2. *U. spicata*, L.! One from Kalm is *Poa Michauxii*, Kunth; another, from Siberia, Pallas, is *Æluropus brevifolius*, Trin.

U. bipinnata, 2nd edit. p. 104, is *Poa* (*Eragrostis*) *cynosuroides*, Retz.

U. mucronata, *l. c.*, is not in the Herbarium.

Dactylis, *l. c.* p. 71.

1. *D. cynosuroides* is *Spartina cynosuroides*, Willd.
2. *D. glomerata*, L.!

D. ciliaris, Mant. 185, from C. B. S., is *Lasiochloa ciliaris*, Kunth.

D. lagopoides, Mant. 33, is *Æluropus lævis*, Trin.

Another, marked, but not by Linn., "*Dactylis paleacea*, 296," is *Kœleria cristata*, Pers.

Cynosurus, *l. c.* p. 72.

1. *C. cristatus*, L.!
2. *C. echinatus*, L.!
3. *C. Lima* is *Wangenheimia disticha*, Mœnch.
4. *C. durus* is *Sclerochloa dura*, P. de B.
5. *C. cæruleus.* One specimen is *Sesleria cærulea*, Arduin; the other is *S. sphærocephala*, Arduin.

6. *C. Ægyptiacus* is *Dactyloctenium Ægyptiacum*, Willd. There are one erect and one procumbent form of the same from Jamaica (Browne).

7. *C. Indicus* is *Eleusine Indica*, Gærtn. One specimen, sent from Browne.

8. *C. paniceus* is *Polypogon Monspeliensis*, Desf., omitted in 2nd edition.

9. *C. aureus* is *Lamarckia aurea*, Mœnch.

C. virgatus, Am. Acad. v. 393, from Jamaica (Browne), is *Leptochloa virgata*, P. de B.

C. Coracanus, Sp. Pl. 2nd ed. p. 106, is *Eleusine Coracana*, Gærtn.

C. Uniolæ, Linn. fil. Supp., is *Brizopyrum unioloides*, Nees; and this contains a small scrap of *Cynodon Dactylon*, Pers.

Festuca, *Sp. Pl.* 1st edit. p. 73.

1. *F. ovina*, L.! Correct, except one from Kalm, which is *F. tenella*, Willd. Another in the Herbarium, marked *F. varia*, Hall. 1439, is also *ovina*.

2. *F. duriuscula*, L.!

3. *F. rubra*, L. has very hairy spiculæ. Linn. in a MS. note says it is a variety of *duriuscula*. One pinned to it is marked by Linn. *F. dumetorum*, and is certainly only *rubra*.

4. *F. amethystina*. Not in Herb.

5. *F. Myurus*, L.! A very small dwarf state.

6. *F. maritima*. Not in Herb.

7. *F. bromoides*, L.! In my opinion, the same as No. 5.

8. *F. decumbens* is *Triodia decumbens*, P. de B.

9. *F. elatior*, L.! Another sheet of this is marked "*F. palustris*, No. 26."

10. *F. fluitans* is *Glyceria fluitans*, Br.

11. *F. cristata*, also marked by Linn. "*Poa cristata*," is *Kœleria phleoides*, Pers., also marked by Linn., on the back of the sheet, "*Alopecurus Monspeliensis*."

F. reptatrix, 2nd edit. Sp. Pl. p. 108, from Egypt, is *Diplachne fusca*, P. de B.

F. fusca, *l. c.* 109, is the same plant.

F. calycina, *l. c.* 110, is *Schismus marginatus*, P. de B. This is also marked "12. *F. barbata*."

F. decumbens, l. c. 110. Not in Herb.

F. serotina, l. c. 111. Not in Herb.

F. dumetorum, l. c. 109. Already mentioned under No. 3.

F. spadicea, L.! Syst. Nat. 732.

F. phœnicoides, Mant. 32. Not in Herb.

There is also a specimen of *F.* [*Vulpia*) *ciliata* not marked by Linn.; also one of *Sclerochloa arenaria*; another, marked "*F.* Hall. Hist. 1445," is *Kœleria cristata*; another, unnamed, is *Festuca borealis,* Mert. & Koch.

F. spinosa, Linn. fil. Supp. 111, is *Eragrostis spinosa,* Pers.

In this envelope, but why placed here I know not, is part of a plant marked "*Nardus spuria Gangitis,* Lobel." It is the lower portion of the culm of *Andropogon laniger,* Desf., known in commerce as *Schœnanthus,* &c.

Bromus, *Sp. Pl.* 1st edit. p. 76.

1. *B. secalinus,* L.! Pinned to it a specimen of *B. mollis,* marked "*B. hordeaceus,* No. 32."

2. *B. squarrosus,* L.!

3. *B. purgans,* from Upsal Garden, is the same as No. 4.

4. *B. ciliatus,* L.! From Kalm, and his seeds raised in Upsal Garden. One marked *B. ciliatus* by Smith is *B. rubens.*

5. *B. sterilis,* L.!

6. *B. arvensis,* L.! marked by Smith "Cav. Ic. 590."

7. *B. tectorum,* L.!

8. *B. hordeaceus.* Omitted in 2nd edition, and referred to *B. mollis,* which it is.

9. *B. giganteus,* from Arduin, is *Festuca gigantea,* Vill.

10. *B. pinnatus* is *Brachypodium pinnatum,* P. de B.

11. *B. cristatus* is *Triticum cristatum,* Schreb. In the MS. notes of 2nd edition it is transferred to *Triticum.*

B. mollis, L.! 2nd edit. p. 112. One small specimen is marked "*B. nanus,* Weigel."

B. Madritensis, L.! Am. Acad. iv. 265. From Upsal Garden; another specimen, marked "No. 35 *Bromus erectus,* R. Syn.," is also this.

B. rubens, L.! Am. Acad. iv. 265. From Spain.

B. scoparius, L.! Am. Acad. *l. c.* The true plant from Spain; another marked *scoparius* is *B. Japonicus.*

B. racemosus, L.! 2nd edit. Sp. Pl. p. 114. Linnæus has marked one specimen *B. secalinus*.

B. triflorus, *l. c.* p. 115. Not in Herb.

B. distachyos, Am. Acad. iv. 304, is *Trachynia distachya*, Link. One specimen is marked by Linn. as his *Secale bromoides*; and another, pinned to it, No. 36, from England, is *Brachypodium sylvaticum*.

B. inermis! Mant. 186, is in Herb.; but no specimen is so marked by Linnæus.

B. ramosus. There is much confusion, again, about this plant. The plant described in Mant. 34, sent from the East, and marked "Allioni, 2233, from Scheuchzer," is *Brachypodium ramosum*, R. et Schultes, the term *ramosus* being applicable to the stem. The only plant marked *ramosus* by Linn. is *Bromus asper* of Murray, sent by Schreber.

B. geniculatus, Mant. 33, is *Festuca* (*Vulpia*) *geniculata*, Willd.

B. rigens, Mant. 33, is a hairy-glumed state of *B. scoparius*, L.

B. stipoides, Mant. 557, is *F.* (*Vulpia*) *geniculata*, Willd.

There is also a specimen of *B. erectus*, Huds., marked "*B. agrestis*, Allioni." A specimen of *Brachypodium sylvaticum* is marked "*Bromus gracilis*, Weigel."

Stipa, *Sp. Pl.* 1st edit. p. 78.

1. *S. pennata*, L.!

2. *S. juncea*, L.! One is correct, and one specimen is *S. sparta*, Trin., with much smaller flowers.

3. *S. avenacea*, L.! "Virg. Gron. 133." This is also marked "No. 3. *capillata*."

S. capillata, L.! 2nd edit. p. 116. There is a specimen not named.

S. tenacissima, Am. Acad. iv. 266, is *Macrochloa tenacissima*, Kunth.

S. membranacea, 2nd edit. p. 116, is *Festuca* (*Vulpia*) *uniglumis*, Solander.

S. arguens, *l. c.* p. 117, is *Anthistiria ciliata*, Linn. fil.

S. Aristella, Syst. Nat. iii. 229, is *Aristella bromoides*, Bertol.

S. Spinifex, Mant. 34, is *Spinifex squarrosus*, Linn. fil.

S. spicata, Thunb. 378, is *Heteropogon hirtus*, Pers.

There is also a specimen of *Lasiagrostis Calamagrostis*, Link, without a name.

Avena, *l. c.* p. 79.

1. *A. Sibirica*, from Gmelin, is *Stipa Sibirica*, Lam.

2. *A. elatior* is *Arrhenatherum avenaceum*, P. de B.

3. *A. Pennsylvanica*, from Kalm, is *Trisetum palustre* of Trinius and American authors.

4. *A. Lœflingiana*, from Spain, is *Trisetum Lœflingianum*, P. de B.

5. *A. sativa*, L.! One specimen is marked by Linn. *A. ponderosa*.

6. *A. fatua*, L.! One sheet marked 6 is *A. barbata*, Brot.

7. *A. flavescens* is *Trisetum flavescens*, P. de B. Pinned to it a specimen of *A. pratensis*.

8. *A. fragilis* is *Gaudinia fragilis*, P. de B.

9. *A. pratensis*, L.! Some specimens are also marked "*spicata*," which they are not.

10. *A. spicata*, from Kalm, is *Danthonia spicata*, N. et Sch., also marked "*bromoides*."

A. nuda, Am. Acad. iii. 401, is an unnamed state of *A. sativa*.

A. sterilis, L.! 2nd edit. Sp. Pl. p. 118, is probably only a form of *A. fatua*. One pinned to it, also marked *A. sterilis*, is *Macrochloa arenaria*, Kunth.

A. sesquitertia, Mant. 33. No specimen in Herb.

A. pubescens, L.! 2nd edit. Sp.Pl. 1665, is only a form of *A. pratensis*, as Linnæus in a MS. note suggests: he has also marked it "*Avena* near *sesquitertia*."

A. stipiformis, Mant. 34. Not in Herb.

A. patula, Hall. Hist. 1489, from Dick, is a small state of *A. pratensis*.

A. bromoides, Sp. Pl. 1666, is *A. pratensis*, L.

A. hispida, Thunb., is *Tristachya leucothrix*, N. ab E.

There are four species of *Danthonia* from C. B. S. without names, but probably sent by Thunberg. The same envelope contains a specimen of *Andropogon Schœnanthus*, a scrap of *Diectomis fastigiata*, and of *Bromus squarrosus*.

Lagurus, *Sp. Pl.* 1st edit. p. 81.

1. *L. ovatus*, L.!

L. cylindricus, 2nd ed. p. 120, is the large European form of *Imperata arundinacea*, Cyrill.

Arundo, *l. c.* p. 81.

1. *A. Bambos* is *Bambusa arundinacea*, Willd. The leaves attached are small, and the stipules spinous.

NOTICE.

It is proposed to issue four numbers annually, as nearly as possible at definite intervals, containing Papers on Natural History read before the Society, and not inserted in its "Transactions." The Zoological and Botanical Papers will be separately paged, so that either section may be taken separately.

The "Journal of the Proceedings" for the present year will be sold to the Public at 12*s.* for the entire Journal, or 8*s.* for either the Zoological or Botanical section taken separately,—the separate numbers being charged 3*s.* for the whole, or 2*s.* for either section.

The number and importance of the Papers read before the Society have induced the Council to determine on the occasional publication of Supplemental Numbers, of which five belonging to Botany, and one to Zoology, have already appeared.

The "Journal of the Proceedings," together with the "Supplements," are sent free of charge to Fellows of the Society.